







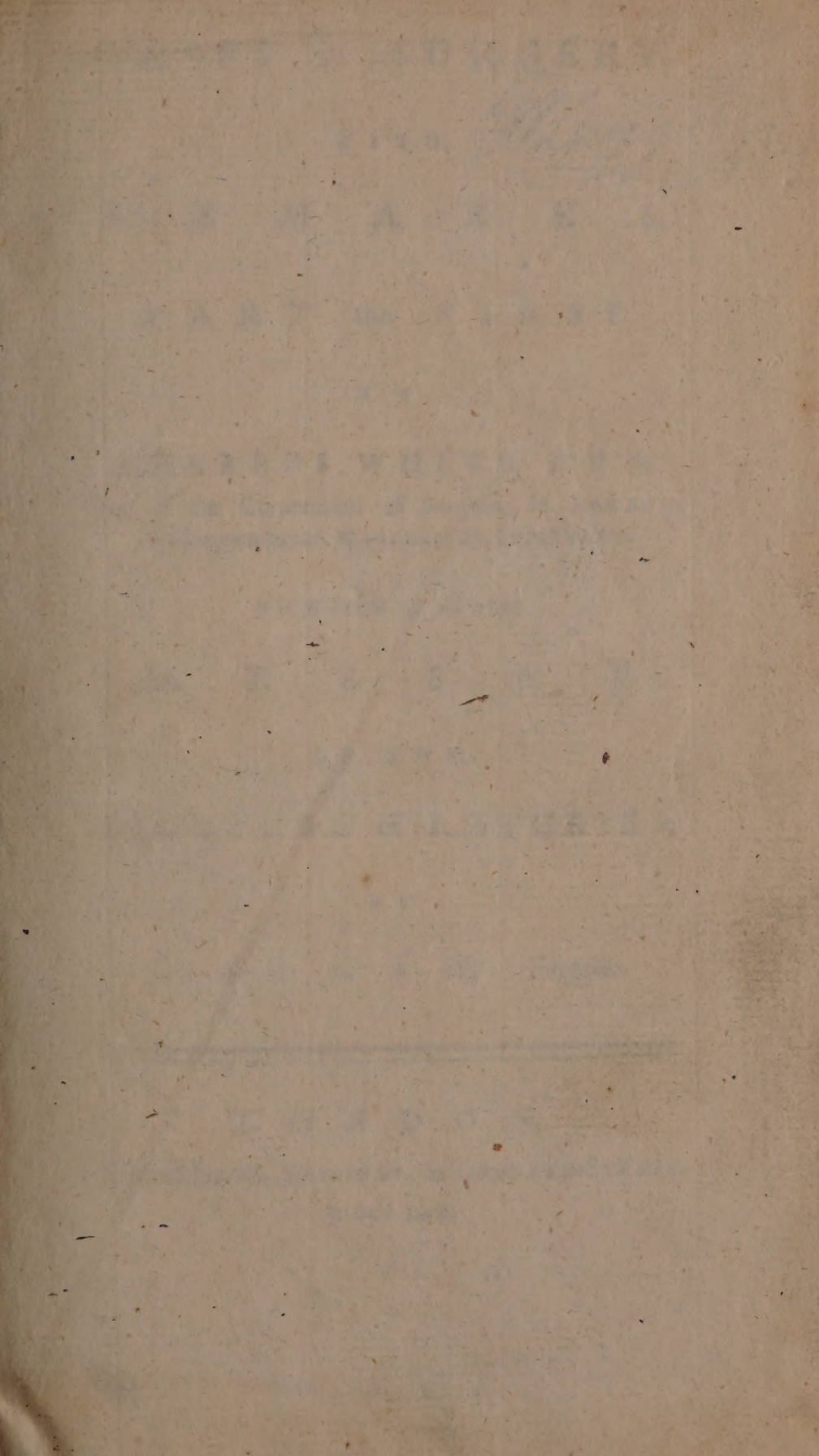




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WHITE, Charles









CASES in SURGERY,

WITH

*W. Mangley*

R E M A R K S.

P A R T the F I R S T.

B Y

C H A R L E S W H I T E, F. R. S.

One of the Corporation of Surgeons in LONDON,  
and Surgeon to the MANCHESTER INFIRMARY.

TO WHICH IS ADDED,

A n E S S A Y

O N T H E

L I G A T U R E of A R T E R I E S,

B Y

J. A I K I N, Surgeon.

---

L O N D O N,

Printed for W. JOHNSTON, in LUDGATE-STREET.

M DCC LXX.

CASES in SURGERY.

WITH

R. E. M. A. R. K. S.

PART the FIRST.

BY

CHARLES WHITE, F.R.S.

One of the Corporation of Surgeons in London,  
and Surgeon to the Manchester Infirmary.

TO WHICH IS ADDED,

An ESSAY

ON THE

SIGNATURE OF ARTICLES.

BY

H. A. I. R. I. N. Surgeon.

L O N D O N.

Printed for W. Johnston, in Ludgate-Street.

MDCCLXX.





T O

Dr. THOMAS WHITE

T H E S E

C A S E S

A N D

R E M A R K S

Are Humbly I N S C R I B E D,

By his most DUTIFUL SON,

The A U T H O R.

as theoretical reasoning would scarcely allow us to hope for. They cannot therefore fail of being useful and agreeable to the followers of the healing art, if faithfully related; and I can assure the public that it has been my only aim to represent facts as they really were, not as they would tell the best.

SOME improvements of practice in cases that frequently occur are also attempted, of which I shall only say, that I have been determined by their success, not by a love of novelty, in adopting them, being well aware that nothing is a real improvement, in our profession, but what, considered in all its circumstances and consequences, contributes to a more easy, effectual, and speedy cure.

I HAVE



I HAVE also in some cases endeavoured to corroborate the observations and improvements of others in points of practice, which do not frequently fall under the inspection of one man, and therefore require the united confirmation of others; and it is to be wished that men in every science would, as much as possible, divest themselves of that illiberal spirit of prejudice and jealousy, which is too apt to prevent the mutual assistance which they owe to one another, and to the public.

IN the remarks subjoined to these cases I have been very cautious of drawing inferences from a too abstruse and speculative reasoning upon the fact, but have rather chosen to confine myself to the most obvious and

simple deductions from the event of the case.

SEVERAL of these cases and remarks have been already published, some of them in the Philosophical Transactions, and others in the Medical Observations and Inquiries: but I imagine it will be full as agreeable to the readers to see them all together in one volume, especially as some of them are connected with these now first published, and they help to confirm each other. I have likewise selected such cases from a number which my father took minutes of when he was in full practice, as are similar to those of my own, which I have now transcribed for publication.



THE few cases I have here given of the stopping of bleeding arteries by sponge, are not intended to shew it's utility in all hæmorrhages whatsoever, but in those where the ligature could not possibly be made use of, or in such as had resisted the the most approved methods of practice, and of consequence brought the life or limb of the patient into danger.

I PROPOSE to give the public a second part of this work, as soon as my avocations in business will permit me, and am sufficiently furnished with materials for that purpose.

I HAVE only to beg that those who find any thing to censure in the style or composition of these papers  
would

[ x ]

would be pleased to consider that they were drawn up in the hurry of an extensive and fatiguing practice ; and I hope the public will receive them, as being at least the well-meant efforts of one who wishes nothing so much as the improvement of his profession, and the general welfare of mankind.

MANCHESTER,  
MARCH 10, 1770.

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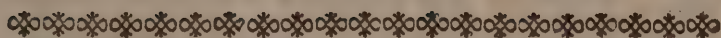





# C A S E S

I N

## S U R G E R Y, &c.



*An Account of a new Method of amputating  
the Leg a little above the Ankle Joint ;  
with a Description of a Machine particu-  
larly adapted to the Stump.*

 N disorders of the ankle which  
require amputation, I have of-  
ten, with regret, robbed the pa-  
tient of a great deal of the sound  
part of the limb, by conforming to custom,  
and amputating in the usual place a little  
below the knee. For though in all other  
B *requisite* amputations

amputations surgeons endeavour to preserve as much of the limb as possible, yet the difficulty which was found of adapting artificial legs to the ends of the stumps, and the inconveniencies which attended such long stumps when they were fixed to the bended knees, made this practice very general: not that there have been wanting surgeons who have performed the operation in the lower part of the limb and contrived artificial feet to walk upon, particularly in the last century Verduin, Solingen and Dionis. It is no wonder this practice should soon fall into disrepute, when the surgeons of those days were unacquainted with the double incision, when the flap operation was not brought to perfection, and their machines were, in comparison of ours, complex, rude, and heavy.

THE following circumstances fixed me in the resolution of operating in this part. At the latter end of the year 1760 I happened to see a woman who had her leg taken off a little above the ankle twenty years before, by advice of her brother, who was

2

a carpenter,

a carpenter, and had promised to make her a wooden leg of his own contrivance. The surgeon at first refused to amputate in this place ; but being told that if he would not they would apply to another, he consented to do it contrary to his own opinion. The operation was performed by the single incision: the stump was twelve months in healing, and the surgeon died before the expiration of that time. Her brother made her the wooden leg as he had promised, and a wooden one it really was to all intents and purposes ; but notwithstanding all these disadvantages, she declared she would not have had it taken off in the usual place upon any account whatsoever, as she found she had so greatly the advantage of others who had suffered amputation in the common manner. Indeed she herself had, for a little while, worn a common wooden leg fixed to her bended knee, but soon threw it aside in favour of the other, which gave her the free use of her knee joint in flexion and extension. I was myself fully convinced of the utility of this method from her great activity, both in walking upon



level ground and in going up and down stairs, and I had not a doubt, both that a better stump might be made, and a more convenient machine contrived.

THE first opportunity I had of operating in this part was on August 10, 1761, upon William Slater, whose case I have related in my account of the use of the sponge in the stoppage of hæmorrhages, Case IV. I purposely omitted at that time mentioning any thing of the method of operating, as it was foreign to my intent in that publication, and as I fully proposed giving it to the publick as soon as experience had enabled me to speak with greater certainty. I performed it by the double incision, beginning the first as near the ankle joint as I could, in order to make as long a lever as was possible, and hereby give him a greater power in walking. The stump was healed in about three months; he died of a consumption soon after, so that I had no opportunity of trying the walking machine which I had invented.

THE next leg which I amputated a little above the ankle was that of James Oates, a patient in the Infirmary, on September 1, 1761, whose case is likewise related in the same pamphlet, Case IX. This I did not take off quite so low as the former, by which I thought to make a better stump, as there would be rather more substance in the lower part of the muscles, than in the Tendo Achillis, from whence granulations of flesh would be more likely to sprout up. This method fully answered my expectations; the stump was intirely healed in ten weeks, and was not in the least pointed, but perfectly flat at the end, when it was fitted with a machine, *vide plate*, I. simple in it's contrivance, and of an easy expence. After this I took off six others in the same manner, and had the satisfaction to see them all fully answer my expectations. I afterwards recommended this method to several gentlemen both in London and in the country, and found, with pleasure, that they were equally successful; nor did I see that any improvement could be made in this operation till the latter end of the

year 1765, when Mr. O'Halloran, a surgeon, at Limerick in Ireland, published his *Complete Treatise on Gangrene and Sphacelus*, with a *New Method of Amputation*, which is an improvement of the flap operation.

THE flap operation was originally an invention of Lowdham, an Englishman, and published by Jacob Young, in 1679 in his *Curvus triumphalis ex Terebintino* ; it was afterwards practised by several French, German, and Dutch surgeons ; but being from many trials found insufficient it was disused. The merit of bringing the flap operation to perfection was reserved for Mr. O'Halloran, and he is justly entitled to the thanks of the public for it. The chief alteration he made, was instead of uniting the flap immediately, to defer it till the 10th, 12th, or 14th day, and to dress the extremity of the stump and the flap as distinct and separate sores till that time, when all inflammation will have subsided, the rough edges of the bone will be covered, and the suppuration will be completely established ; and on this circumstance alone  
the



the success depends. He had not, when his treatise was published, operated in this manner more than three times ; and his amputations were all of them those of the leg in the usual place below the knee. He indeed very strongly recommends this method in amputating the thigh, arm, and forearm, and has laid down plans for the operation. He moreover says (p. 266.)

“ In the common method a disorder even  
 “ of the foot makes amputation near the  
 “ knee necessary, because here the wooden  
 “ leg rests ; but in this you may cut  
 “ lower down, as the extremity of the  
 “ stump may rest in the hollow of an ar-  
 “ tificial leg, which the cushion of flesh  
 “ enables it to do, and the remains of the  
 “ limb will have the power of bending  
 “ and extending as freely as ever.”

I TRIED the flap operation in the first case I had, after reading Mr. O'Halloran's treatise, in which amputation in the lower part of the leg was adviseable. I began my incision where the Tendo Achillis is inserted into the Os Calcis, and with one

stroke of a strait knife cutting obliquely upwards for about three inches, I formed the flap, in which the Tendon was included; then with one stroke more of the same knife by a semicircular incision, I cut down to the bones at once. After the operation was finished, the stump and flap were dressed separately; the flap was laid gently up to the end of the stump, and kept from coming into contact with it by the intervention of the dressings; which were renewed in the same manner as often as was necessary to prevent it's being offensive, till the 12th day, when the flap was laid up to the bare stump, and retained there by slips of good sticking plaister. In a few days it was evident that the flap began to adhere; and the stump was perfectly healed in less than two months; though the patient was detained a little longer in the infirmary to have a machine fitted to his stump.

WHEN I first began to amputate in this part in the year 1761, and for some years after, I was very cautious in preventing the end  
 I of

of the stump from pressing upon the bottom of the socket that contained it ; but after performing the flap operation, I found my cautions unnecessary, as the patients, before they left the infirmary, could put the ends of their stumps to the ground, and rest their whole weight upon them.

*A List of the Persons upon whom I have performed the FLAP OPERATION a little above the Ankle.*

	Age.	when performed.	when discharged.
		1766	1766
Robert Thornton —	21	March 26	June 2
Edward Serles —	11	May 16	Aug. 4
Robert Wood —	62	July 26	Oct. 20
Alice Barlow —	40	Aug. 1	Nov. 20
		1768	1768
Robert Brierly —	26	May 12	Aug. 15
Ralph Mort —	20	June 17	Aug. 22
Mr. Jonath. Jackson, merchant, Lancaster }	27	Sept. 22	Died about a month after
		1769	1769
Robert Kerfall —	16	July 5	Oct. 16

MR. JACKSON was in the last stage of a consumption when the operation was performed ; but as we often see surprising recoveries, when the disorder is occasioned by absorption, after the removal of the cause,



cause, we were willing to give this poor gentleman all the chance we could. *An-ceps remedium satius est experiri quam nullum.* The case however certainly turns out in favour of the flap operation, for the flap was perfectly united before his death, which happened in a month after, and, as he might be said to be in a dying condition, I think we need not despair of the union of the flap in any case whatever.

#### R E M A R K.

NOTWITHSTANDING the very great improvements that have been made in surgery within these few years, and all which Mr. Bilguer has said in his treatise of the inutility of amputation, that operation still is, and I am afraid will often be, found adviseable. Not that I am an advocate for it in any case, but where it is necessary to save the patient's life, or where the limb is become quite burthensome, and I must so far join with that gentleman as to believe it is sometimes unnecessarily performed; but it is to be hoped that the daily improvements in the art will remove the  
cause

cause of this reflection, and that every attempt to lessen the inconveniences necessarily attendant upon the loss of a limb, will be well received by the public; and not construed into a desire of multiplying operations for a specious shew of dexterity, since it certainly redounds more to the honour of a surgeon to save one limb than to take off a hundred.

It is further to be observed, that all the patients here mentioned were afflicted with diseased joints, from a scrophulous habit, which is extremely prevalent in this country, and renders a stump more tedious in healing, than most of the disorders requiring amputation.

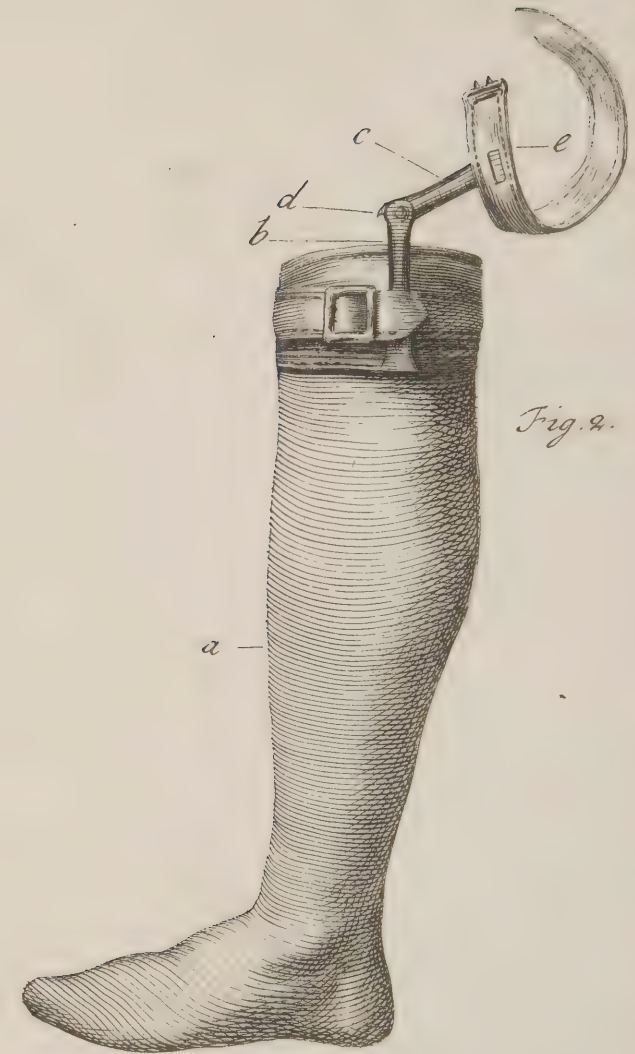
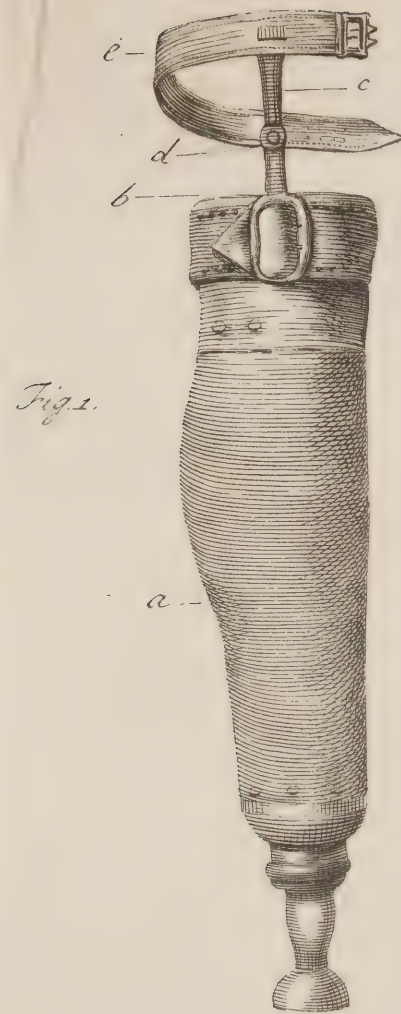
In making the semicircular incision in the forepart of the leg, I have used the double incision as well as the single one, and I am rather inclined in favour of the double one, which makes a better stump, is sooner healed, I believe causes very little additional pain, and indeed in some cases, where, from particular circumstances the  
flap

flap cannot be made large enough, is absolutely necessary.

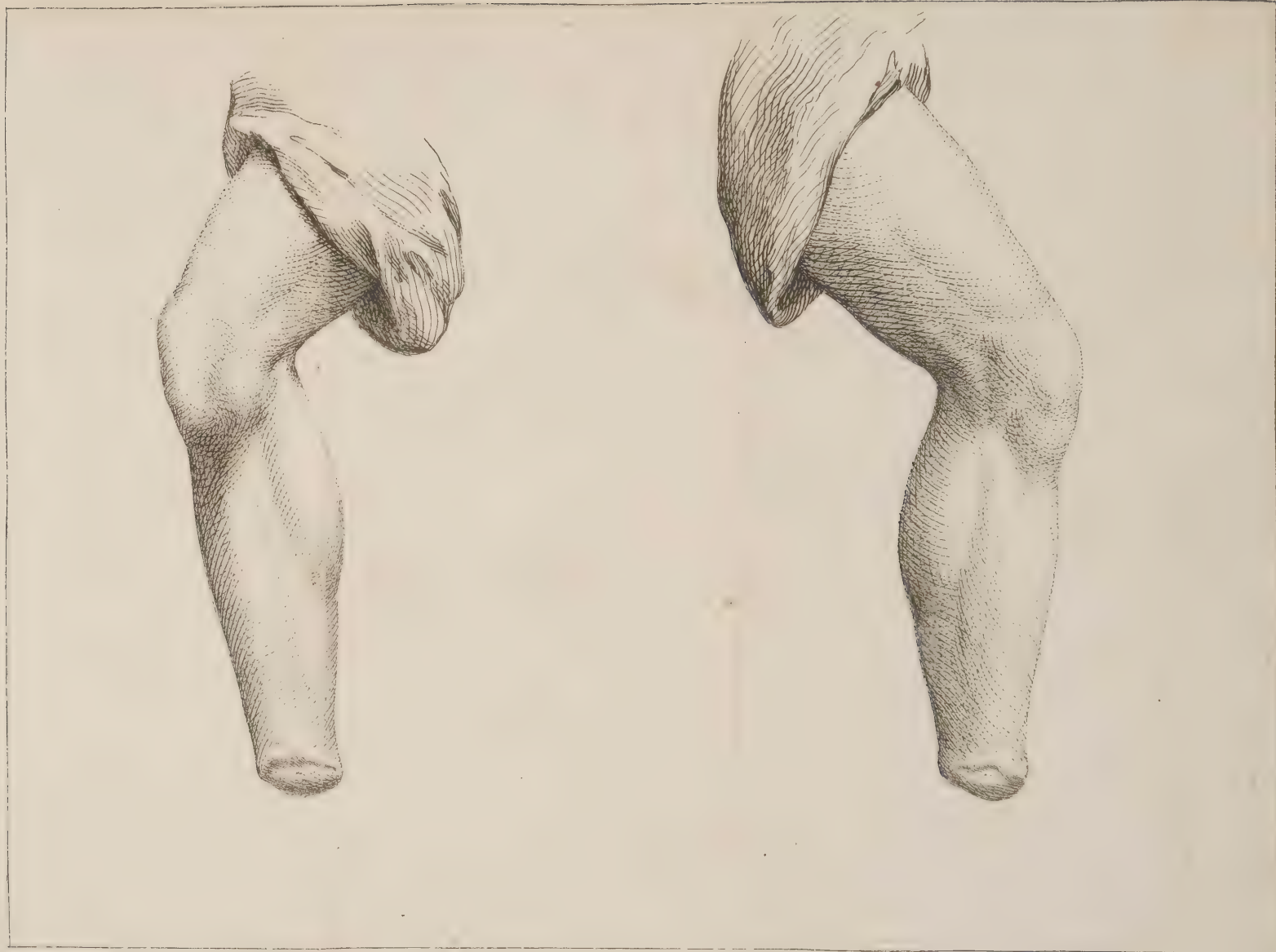
IT is likewise to be remarked, that in all cases wherein I have performed the flap operation, the vessels were secured either by ligature without the needle, or by sponge. It would be imprudent to use the needle, as we are not certain of removing the stitches in proper time, and sometimes in tendinous and membranous parts are not at all able to do it without cutting it, which is always attended with pain and trouble, on account of granulations of flesh which sprout up and cover it; and it would not be adviseable to unite the flap till the stitches are removed, as I have sometimes seen troublesome consequences, and have known the cure rendered very tedious in a common amputation, from a single stitch remaining; but when the vessel has been drawn out by the forceps or tenaculum and included in the ligature alone, the ligature has generally fallen off before the time of uniting the flap, and if it does not, it is certain in a little while to come away without any art.

*Cases*













*Cases of Accumulation of Fæces in the Intestines.*

MARTHA OGDEN, of Oldham, aged fifteen years, was admitted into the Infirmary, November 17, 1760, for a supposed tympany, with which she had been afflicted a little above three months. Her abdomen was so much distended that her disorder had greatly the appearance of an ascites, and tapping was proposed. To this I objected, both because no fluctuation could be perceived, and on account of some other particulars of her case, which upon a strict enquiry were as follows: For several successive summers, about the month of August, she had been seized with great costiveness, and tumefaction of the belly, which continued till cold weather came on, when she had copious discharges by stool, which perfectly relieved her till the same time of the year returned. But at this time nature was not able to relieve herself. Her belly was increased to an enormous size, and the  
poor

poor girl was become so extremely weak when brought to the Infirmary, that nothing was done for her. She staid only a week there, was discharged at her own request, and died three days after. I had seen her but once (she not being my patient) and then proposed an examination of the rectum, in order to find whether any thing obstructed the passage. This I learned was afterwards done, but only by the nurse, and nothing was discovered.

HER friends acquainted me with her death, and gave me the liberty of opening the body. Business prevented me from going myself; but I sent a young gentleman, who was at that time my apprentice. On opening the abdomen he found no great quantity of either air, or water, but an accumulation of excrements which had distended all the intestines, and particularly the colon, which was thicker than his thigh. After taking out most of the excrements, which filled a vessel containing betwixt three and four gallons, a ball was found bigger than both his fists, and weighing

ing



ing eight ounces. He brought it home, and, upon cutting through it, I found it consisted entirely of hardened fœces.

IT is to be regretted this poor girl did not apply for relief sooner, as her life might have been preserved, and her complaints entirely removed, since there were sufficient indications to point out the cause of her disorder. I have met with three other cases of the same nature, but not of so long standing.

THE first was of a gentleman of fortune, upwards of sixty years of age, who had suffered some weeks from a retention of his excrements. He had formerly been much troubled with the piles, which having brought on frequent inflammations, had contracted the sphincter ani. I broke into the hardened fœces with a scoop, and brought away as much as I conveniently could. I spent most of the day in throwing up, with a large ivory syringe, injections, consisting of the yolks of eggs and olive-oil, till I thought the hardened excrements were dissolved;

after

after which I prescribed a purgative glyster that fully answered the intention, bringing away with it a whole close-stool full of excrements, which, with what had been before taken from him, and what followed the next day, entirely relieved my patient, who has never since been troubled with any complaint of this nature.

THE other cases were nearly similar, and the afflicted persons were relieved by the same methods. See a case of the same kind in Gooch's collection, p. 160, second edition.

Dr. Rutty, in his treatise on the urinary passages, page 52, quarto edition, gives the following quotation from Dr. Bamber. " A great quantity of  
 " tophaceous substances, that seemed to me so many  
 " globules of hardened excrements, were lodged in  
 " the beginning of the colon, where the ileum is  
 " ingrafted, and pressing upon the fundus of the  
 " bladder, creates symptoms which aped the stone  
 " so nicely, that only death and dissection there-  
 " upon detected the fallacy. In this case it was al-  
 " most impossible but the most skillful surgeon should  
 " be deceived; for these concreted substances gave  
 " the same resistance to the catheter, and caused the  
 " same sensation to the hand, that a stone would when  
 " in the cavity of the bladder."

*Cases*

*Cases of Plumb-Stones, retained in the Intestines.*

IN July 1760, Thomas Fogg, of Clyfton, about twenty years of age, had been several years subject to great pains in his stomach and bowels. His disorder was differently treated by several of the faculty without any relief; but after he had left off all medicines for about a year and half, he voided, by stool, fourteen round spongy balls of different sizes, from the bigness of a nutmeg to that of a potatoe. Some of them being cut in pieces, were found to have plumb-stones in their centers.

JAMES CHORLTON, of Clyfton, aged forty, was troubled with very severe pains in his stomach and bowels, with a diarrhœa, and violent vomitings of blood and mucus. These complaints returned frequently at uncertain periods for fourteen or fifteen years. About six years ago in one of these fits of vomiting, he threw up twenty-three plumb-stones, and parted with several others by stool. They were just glazed

C

over



over with a hardened mucus. He imagines they had lain in him several years, as he frequently eat plumbs some years before, and sometimes swallowed the stones ; but was certain they must have staid with him at least eleven months ; for he had never eat a plumb during that time. As his complaints have continued ever since without any remarkable alteration, except that of his being reduced to a weaker and lower condition, he apprehends, with too much reason, that there are still more plumbstones lodged within him.

ON March 2, 1762, Dr. Brown, a very ingenious physician of this place, desired I would visit I. Parkinson, of Manchester, an out-patient of the Infirmary, who had been some time under his care for complaints much resembling nephritic paroxysms, which the medicines usual in such cases had frequently relieved. The night before he had perceived a lump in the rectum which had brought on a continual tenesmus. I found him extremely emaciated ; the sphincter ani very much dilated

lated, with a continual discharge of thin, excrementitious and very fœtid matter. Upon introducing my finger into the anus, I very distinctly felt a large body, moveable in the rectum, which I easily took hold off with a pair of forceps, such as are used in lithotomy, and immediately brought away without much difficulty. It was a ball nearly as big as my fist; and, breaking in the extraction, discovered a plumb-stone in the center, which was it's nucleus. Upon further examination, I found there was another, which I extracted entire, nearly as large as the first. The patient recovered very fast, and in a month's time was a hearty strong man.

A. B. of Chowbent, a young woman of about twenty five years of age, had, for several years, been troubled with severe pains in her bowels, sometimes attended with violent costiveness, and at other times with an obstinate diarrhœa. She was greatly emaciated, and reduced so low as scarcely to be able to walk over the floor. She complained of great pain about the anus,

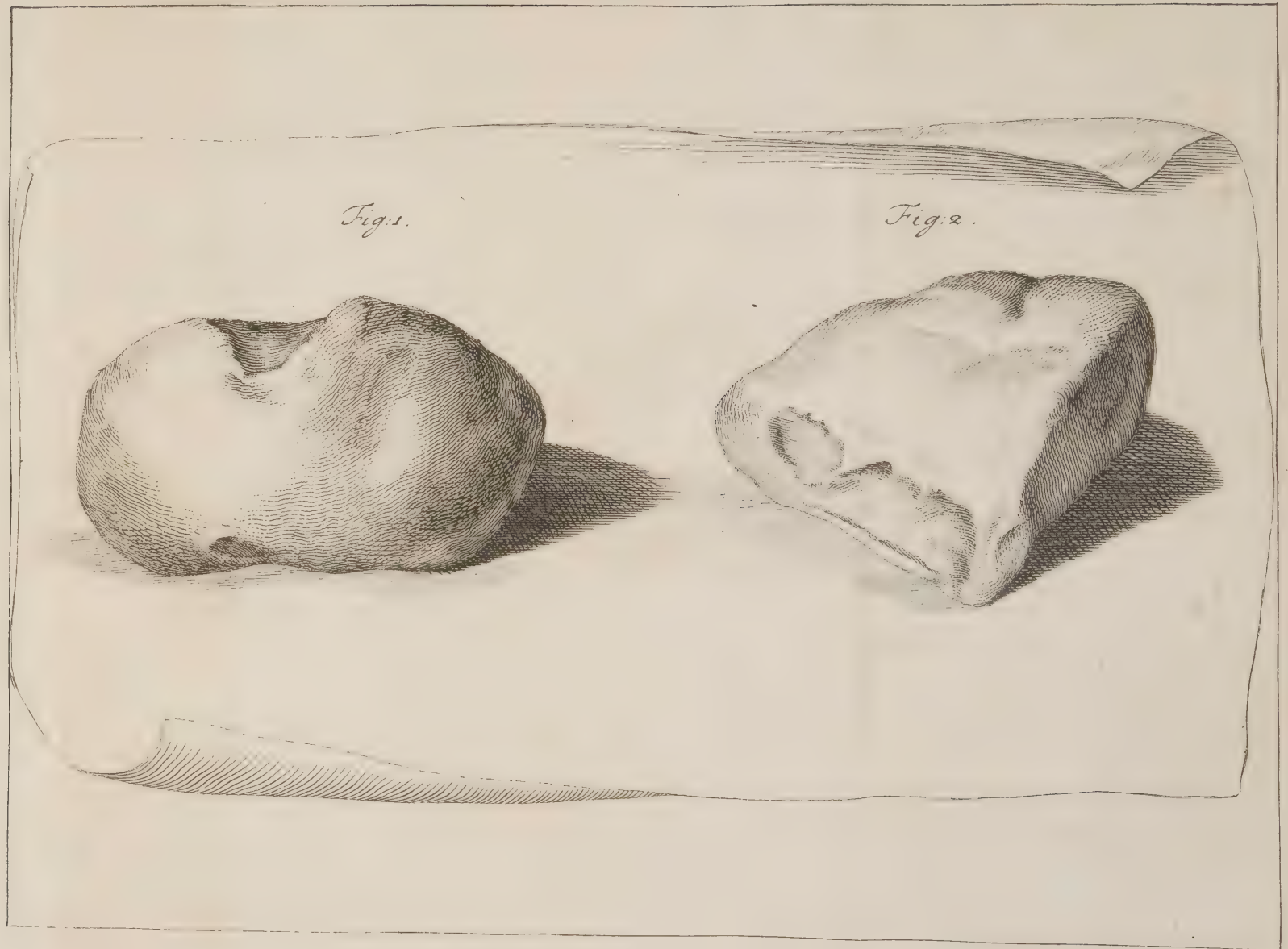
and an involuntary discharge of thin fœces, which were extremely offensive. The sphincter ani was much dilated. I introduced a thick probe into the rectum, and plainly felt a large round ball. I was perfectly convinced that this was a similar case to that I have just related; when, introducing a pair of large forceps I easily extracted a round ball, weighing about four ounces; and after that another of an oblong form, but nearly of the same weight \*. Her strength and spirits soon returned, and she was restored to her former health. Upon cutting open one of these balls a plumb-stone was found in the center.

#### R E M A R K.

CASES of this kind are not very uncommon, and are related by several authors. My intention in publishing these is not only to inform young practitioners, but to warn mankind in general of the great danger which attends the swallowing of the stones of fruit; and I doubt not but many

\* Vid. plate III. fig. 1 and 2.







have lost their lives from this cause, when the disorder has not been known, but mistaken for the cholic. Parents would do well to warn their children of the danger they incur by this practice; and I cannot help mentioning a ridiculous notion among the common people, that swallowing the stones helps the fruit to digest.

For a further particular account of similar cases, see *Philos. Trans. abridged*, vol. v. p. 256, & seq. *Edinburgh Med. Ess. and Observ.* vol. i. p. 301. *Ibid.* vol. v. p. 431. *Essays Phys. and Literary*, vol. ii. p. 345. *Dr. Leigh's Natural History of Lancashire*, plate 1, fig. 4.





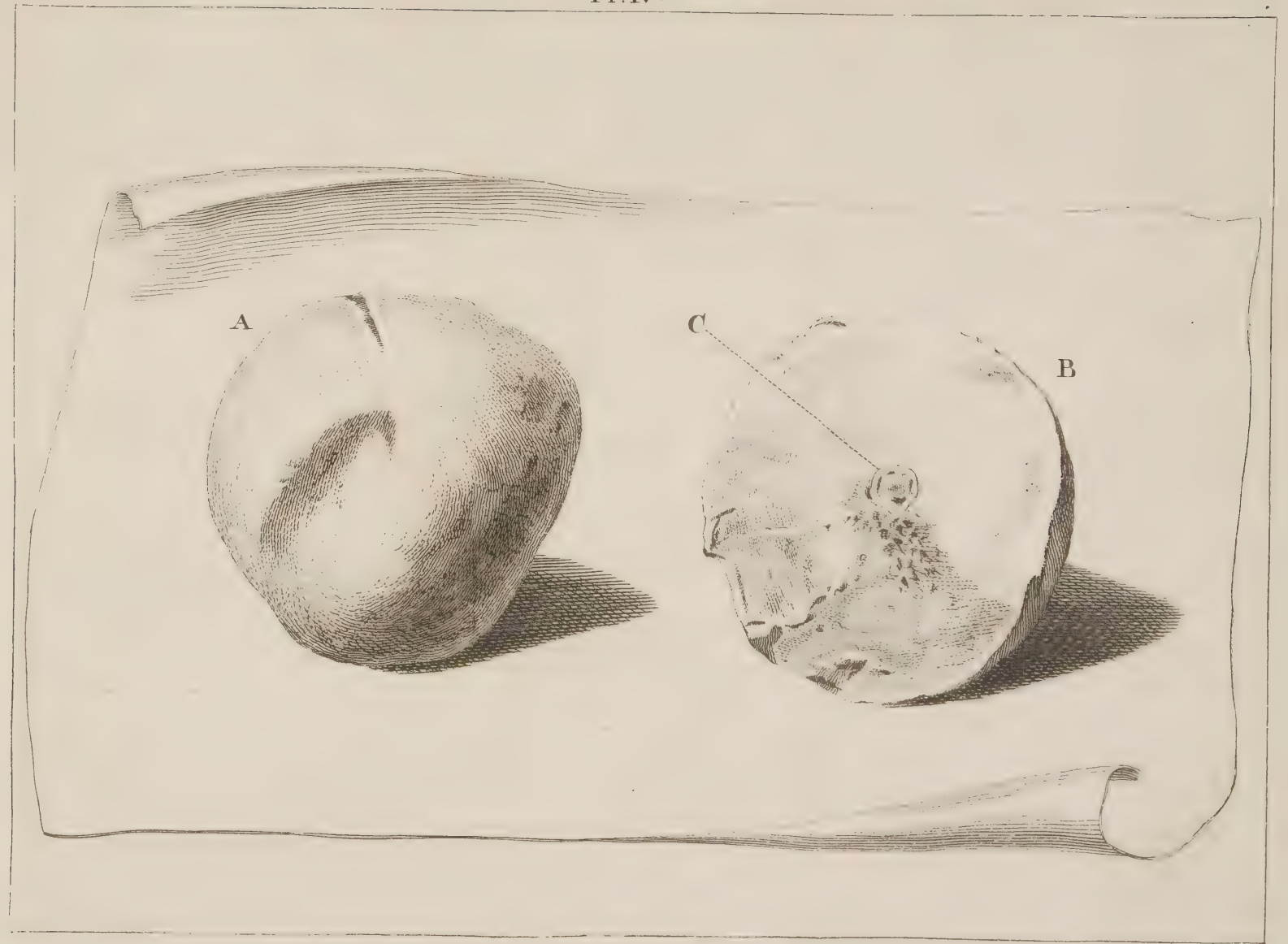
*A Case in which five spongy Balls, containing each a Cherry-Stone in their Center, were extracted from the Anus, by Dr. Thomas White.*

ON August 20, 1725, I saw a young man at Taxwell in Derbyshire, who had been for four months troubled with a violent cholic and looseness, which had resisted all the means that had been used by a country apothecary. He was reduced almost to a perfect skeleton; he had a cadaverous look, and the most horrid stench about him that I ever smelt. He was so weak that, though sensible, he was unable to make any reply to my questions; and, for two months past, had been incapable of stirring from the posture he lay in. His excrements came from him involuntarily. He had not one sound part about his hips and buttocks to lie on, being excoriated up to the back-bone, by the sharpness of the filthy matter that was discharged from the anus. Upon a further enquiry I discovered, that he had lately complained of a tumour in ano. I therefore desired that he might, if possible,

be put in a proper posture to view it, which was accordingly done. The sphincter of the anus seemed to be quite consumed, and the passage was so much dilated, that I could see several inches up the intestinum rectum, and in it a large tumour, which I felt with the handle of a long spoon, and found to be a moveable body. I introduced my hand with no great difficulty ; and though it was a large spongy ball, I easily extracted it, and after that another as big, with three smaller ones. The biggest weighed four ounces, the others two ounces each ; they consisted of an excrementitious substance, and had each a cherry-stone in their center.

I ORDERED an injection of *sp. vin.* and *mel. Egypt* to be thrown up three or four times a day, and proper dressings to the external parts. The patient perfectly recovered, and six months after I saw him a healthy young man.







## P L A T E IV.

One of the larger balls of the exact size, after being dried, which diminished it greatly.

*A* The ball entire.

*B* The ball cut in two.

*C* The cherry stone in the center.





*An Account of two Stones, which, upon dissection were found in the Colon, by Dr. Thomas White.*

A GENTLEMAN's servant of this town, aged seventeen, applied to me on account of the following disorder. About four years before, he had been seized with a sudden lameness in his right thigh, and complained of a pain in his hip, which gradually grew worse. About two years after, he was attacked with stitches in the right hypochondre, attended with a fever, which was treated by his apothecary as pleuretic. He was afterwards afflicted with violent cholic pains, and with *borborygmi*, so loud as to be distinctly heard into another room. Tumours suddenly appeared on different parts of the abdomen, which as suddenly disappeared, and always went off with a looseness. He was the most emaciated subject I ever saw ; and, as he died soon after, I had the liberty of opening him. Upon elevating the sternum, I found the lungs adhering to the pleura,

no

no water in the pericardium, the heart something bigger than usual, with a polypus in the left ventricle. On examining the abdomen I found the liver to be increased to three times it's natural size, it was of a good colour, seemed to be loaded, but not scirrhous, and adhered closely to every thing about it. The gall-bladder contained a proper quantity of gall. The stomach was so diminished that it seemed but one continued tube from the œsophagus to the duodenum. The intestines were of an uncommon whiteness, curiously spread with blood vessels, and as full as if they had been injected; they had very little alimentary or excrementitious matter in them, but were filled with air. In turning them over, about four inches before the valve of colon, I felt a very large stone; and about a hand's length distant another still larger. In cutting them out I found the cœcum and the beginning of the colon adhered to the peritonœum: after freeing them I discovered an abscess in the interstice betwixt the iliac and psoas muscles of the right side. One of the stones weighed two ounces, the other



one ounce and an half. I broke the lesser, and found the external stratum as perfectly petrified as that of a stone in the bladder; the rest of it, as it approached the center, appeared to be more spongy, like concremented excrements, but no fruit stone, as is common, was in the middle of it. There were two chalk-stones in the mesentery.

*A very*



*A very large Tumour of the Scrotum, occasioned by a diseased Testicle, and accompanied with a Hernia Intestinalis, cured by an Operation.*

ABOUT five years ago I was sent for to T. B. a farmer, near Leigh, in this county, of upwards of sixty years of age. He had a large tumour in the scrotum that reached down to his knees, and was thicker than his waist, which he apprehended began in his right testicle. It had been twenty years in growing to that size, and had for some years past occasioned great difficulty in walking. A few weeks before, the tumour had suppurated and burst, and continued to discharge a very offensive matter in great quantities. He had likewise from his youth been troubled with a hernia of the same side. The penis and the other testicle were buried in this tumour, which appeared to be a confused mass of putrid flesh. The discharge had brought on hectic symptoms, and he was now confined to his bed, seemingly in the

last stage of a consumption. I informed his friends that there was no chance but from an operation, and that but an indifferent one, as his age and extremely weak state rendered him but very unfit to bear an operation that must necessarily be severe and tedious, from the great deal of dissection requisite to preserve so many parts of consequence. It was however consented to, and I began with a longitudinal incision, made very cautiously, in order to discover the contents. I found that the intestines occupied the upper part of the tumour, in as large a quantity as would have filled a hat crown; and that the lower part appeared to consist of the right testicle, larger than a man's head, and hollow within. I reduced the intestines through the rings of the abdominal muscles, and retained them by a stitch through the teguments. I then proceeded to dissect away the tumour, and left the penis and other testicle entire. The blood vessels were secured by dry sponge, and the common dressings and bandage were applied. The wound went on very happily; he continued



nued to gain strength daily, and is now as hearty and strong a man as most of his age, not suffering the least inconvenience from the disorder. I however advised him to wear a truss, to prevent the intestines from pushing down to the cicatrix.

My father has favoured me with the following nearly similar case.

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An



*An Account of an enormous Tumour of  
the Scrotum successfully extirpated, by  
Dr. Thomas White.*

**J**ULY 20, 1725, I was sent for to Mr. Warrington, of Whaley-bridge, in Cheshire, a very tall, strong, lusty man, aged seventy-two. About twenty years before, he had perceived a hard tumour in his right testicle, which had, since that time, gradually increased to such an enormous bulk that he could not, without the greatest difficulty either sit or walk. At last the pain occasioned by it's tending to suppuration, together with a fever, obliged him to keep his bed. He likewise complained very much of a pain in his loins, and a difficulty of making water, together with great costiveness. When the bandage by which the tumour was supported from his neck was taken off, I viewed it, and found the scrotum to measure, from the os pubis to the bottom, near thirty inches, and apparently capable of containing five or six gallons. The penis was intirely buried in the tumour, a small

hole, not unlike a navel, remaining for the discharge of the urine. The tumour had burst of itself in the most depending part, and the people about him had caught a gallon of reddish matter, with a red sediment, besides what was lost in the bed, and upon the cloaths.

UPON examination with a probe, I found a large putrid body, that proved to be the right testicle in a corrupted state, grown to the size of a child's head, which blocked up the orifice, and hindered the discharge of the matter. I dilated this orifice with a pair of crooked scissars, and two gallons more of the same matter were discharged, together with the testicle, which I easily took out. It's internal substance was of a bright red colour. After taking up an artery, which had been divided, I filled the cavity with tow, well moistened with *spirit of wine* and *mel. Egypt.* made warm, and applied the proper dressings. He rested very ill that night, and a great quantity of thin purulent matter was discharged. His pulse was unequal and trembling,



trembling, the affected parts were cold, and this large bag, which the day before was three fingers thick in the bottom, callous, and rigid, in the morning was become quite flaccid. All these symptoms strongly indicating a mortification, I forewarned my patient and his friends of the danger, in order that extirpation might immediately take place. This being consented to, I proceeded in the following manner: I introduced my hand and arm beyond the elbow, by the incision that was already made, in order to find the penis, and preserve it unhurt; I then divided the sac from it's base to the hole where the urine was discharged, and dissected the skin round the penis, preserving as much of it as possible towards the os pubis, that the surface of the wound might be lessened. I finished with cutting off both sides from the groin. He bore this tedious operation with the greatest fortitude, and the whole wound was cicatrized in two months. The penis was restored to it's natural figure; and notwithstanding his long illness, his advanced age, and the

great discharge of blood and matter, he perfectly recovered a vigorous state of health.

IT is worthy of observation that the spermatic vessels on both sides had degenerated into ligaments, and did not discharge a drop of blood. The left testicle was soft, flaccid, and increased, to near the size of a horse's. It was affected with a perfect hydrocele. The whole mass of flesh, after the operation, weighed eight pounds.

THIS case seems parallel to that of the negro, of which Mr. Cheselden has given a figure, with the following description in his anatomy, edit. 4. tab. 26.

“ THE lower parts of a negro whose  
 “ scrotum was swelled to this size, from a  
 “ kick, (the spermatic vessels being not  
 “ at all thickened) the greatest length  
 “ was twenty-seven inches, and the great-  
 “ est horizontal circumference forty-two  
 “ inches. He was the late Mr. Dickenson's

“ son’s patient in St. Thomas’s hospital.  
 “ The tumour was solid, without inflam-  
 “ mation or pain, but what parts were  
 “ affected we could not learn, he not  
 “ staying for the operation. At the dark  
 “ place he could pull out the penis, when  
 “ the scrotum was lifted up.”

IN a conversation I had some years after  
 with Mr. Cheselden, he was much pleased  
 with my relation of the above case, and  
 regretted very much the negro’s running  
 away out of the hospital, and depriving  
 him of the opportunity of seeing the  
 event.





*Tumours on new born Children.*

**B**ETTY SEDDON, of Eccles, in this county, aged thirteen months, was admitted an out-patient of the Manchester Infirmary, June 8, 1761. She was born with a claret-coloured tumour upon her forehead, which was at first no larger than than a pea, but had increased so fast as now to be full as large as an hazel nut, and, when she cried, was distended to to the size of a walnut. After a strict examination I was of opinion that it might safely be dissected out, and I immediately performed the operation: three arteries, which supplied the tumour, bled freely, but were easily stopped by the application of a piece of soft sponge. I examined the tumour after taking it off. It appeared not to be of the encysted kind, but of a substance much like the corpus cavernosum penis, which enabled me to account for it's greater increase, when the reflux of the blood was impeded by the child's crying. I removed the dressings and sponge on the fourth day, the cure went on very happily, and

and nothing remarkable happened. I have since taken out several other tumours of the same kind, and with the same success. For a similar case, see Warner's cases in surgery, p. 123.

ABOUT fourteen or fifteen years ago a young child was under my care in the Infirmary, with a tumour on it's back nearly as big as a middle sized pear, which it was born with. The tumour was soft, with a perceptible fluctuation, and visibly replete with a transparent fluid.

UPON a closer examination a defect might be distinctly felt in the back-bone; and it is from hence that tumours of this nature are called *spinæ bifidæ*. They may occupy any part of the spine, or back part of the head; as they have their origin from the brain or spinal marrow, and are contained in a cyst, which is an elongation of the dura and pia mater, and the membrana arachnoides. Their contents are a fluid, separated by the brain, cerebellum, and spinal marrow. I advised the parents  
of

of this child by no means to have it opened, but to keep it properly and gently supported. I told them it was uncertain how long the child might live, some in this situation dying very young, while others lived to man's estate; but that none ever survived the extirpating, or even the opening them.

TULPIUS expresses his opinion of this very strongly in his observations, chap. 29, book 3, "*Quam calamitatem, siquidem reformides chirurgi, cave sis improvide unquam aperias quod tam facile occidit hominem.*" This is further confirmed in his chap. 30, of the same book; by Ruyfch Obs. 34, 35, 36; by Dr. Rutty, in Philos. Transf. numb. 336; p. 98, by Mr. Warner, in his cases in surgery. Monro on the dropsy, p. 215; Mis. cur. a. n. c. dec. 2. ann. 2. obs. 158; *ibid.* dec. 1 ann. 1. obs. 152. hist. 2; Gooch's cases in surgery, p. 39; Bonet. Sepulchr. anat. lib. 1. sect. 16, Additament. obs. 4; Haller's Cases, case 14, exp. 5; Platneri Instit. Chirurg. Rat. sect. 747.

THE

THE tumour was however afterwards opened by a surgeon and the child died in a few days. Soon after this another child was brought to me with a tumour of the same kind, upon the occiput ; I gave the parents the same advice I had done to the other, but they likewise applied to another surgeon, who took off the tumour, and the child died the next day.

I HAVE seen many cases of tumours of this sort on various parts of the spine, os sacrum, and occiput, some of which have been unwarily opened, and the event has always proved fatal.

LE DRAN, in his observations of surgery, obs. 1, relates the case of a tumour upon the head of a new born child, covering almost the whole right parietal bone, which had all the appearance of a hernia of the brain, and was perfectly cured by compression.

REMARK.



## R E M A R K.

My intention in relating these cases, is to shew that the tumours which children bring into the world with them, are some of them curable by extirpation, without any danger; and that the sooner this is done the less will be the deformity; but that every attempt to extirpate others should always be carefully avoided, as certain death either immediately or in a few days must be the consequence.

HARE lips, imperforated nostrils, adhesions of the fingers, and of the toes, are best remedied soon after birth, as I have often experienced.



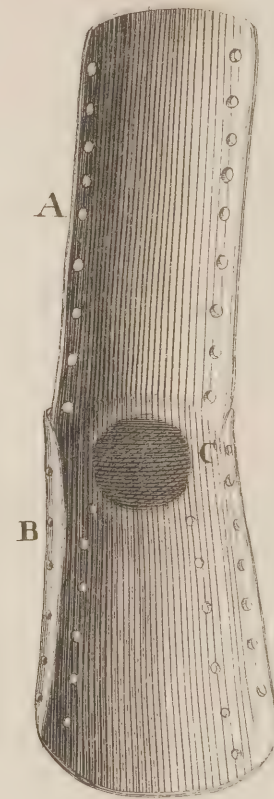
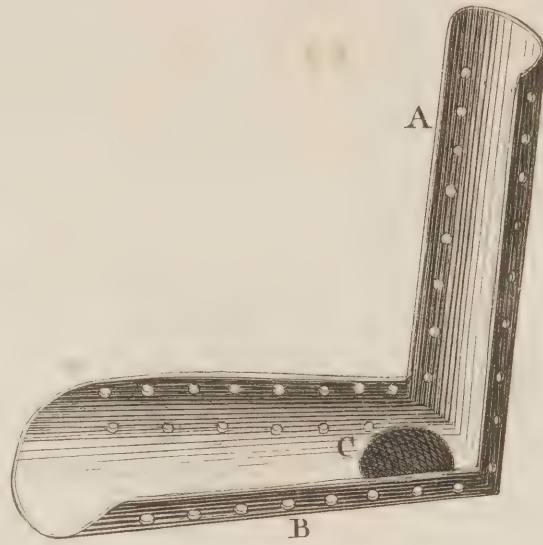
*Vari & Valgi.*

IT seems very clear to me, that those deformities in the feet of new born children, commonly called club-feet, are not owing to any original mal-formation of the parts, but only to the too long continuance of the unborn infant in such a situation in the womb, as permitted a constant pressure from it upon the sides of the feet. If the foot is in this manner turned inwards, the internal malleolus is cramped in it's growth, by the constant pressure of the astragalus, and for want of a proper pressure of the os calcis upon the lowest process of the fibula, this bone grows more luxuriant. The whole muscle called tibialis posticus becomes a little shorter, the peronæus posticus a little longer than what is natural, and so over stretched as to be unable to counterbalance it's antagonist. This deformity is called *varus*, and is much more common than the *valgus*, where the foot is turned outwards, as may easily be conceived from the usual posture of a child in the womb. It is evident

that this last, must, in every respect, be intirely the reverse of the former.

WHAT confirms me in the opinion that these deformities are not the effects of any original faults of formation, is the certain and perfect cure that may be obtained, if the parts are put in a right position immediately after birth, and properly retained in it. Mr. Cheselden, in his appendix to Gataker's translation of Le Dran, and in his anatomy, recommends a bandage made of several slips of linen dipped in a mixture of white of eggs and flour, holding the limb in a proper posture till the bandage is grown stiff; but this method alone will, I believe, scarcely prove sufficient. After securing the parts in this manner, or by slips of sticking plaster, artfully applied, I use a machine, made of tin, lined with leather, well adapted to the leg and foot, and tied on by soft leather thongs. This machine I invented many years ago, and have always found it effectual, frequently without any bandage. The longer after  
 I ~~the longer after~~ birth







birth the cure is delayed, the greater are the difficulties.

For further information on this subject, Hildanus, Parey, Heister, and Cheselden may be consulted.

P. S. Just as these sheets were going to the press, I was informed that Dr. Hunter had, in his lectures, expressed himself much to the same purpose that I have done, in regard to the cause of this deformity. It gives me no little pleasure to find that my opinion corresponds with that of so able a man.

## P L A T E V.

Two different views of the machine for distorted feet.

*A A* The part for the leg.

*B B* The part for the foot.

*C C* The hole for the heel.





*An Account of the successful Treatment of a locked Jaw, and other spasmodic Symptoms, supposed to have been occasioned by a Wound in the fourth Finger of the left Hand. Published in the Med. Observations, Vol. ii. p. 382.*

ON September 3, 1759, I was called to Samuel Wood, aged twenty, an apprentice to a distiller in Manchester, who had been seized four days before with a spasmodic contraction of his lower jaw, and a pain in his throat, and these symptoms were then increasing very fast.

I FOUND his jaw so closely locked as to render it impossible to have it opened without running the greatest risk of breaking it. He was obliged to be nourished by liquid diet only, which was poured between his teeth. Violent convulsive spasms seized him almost every minute; and his head was thrown back with such violence whenever he attempted to rise

from his chair, that he was frequently dashed against the ground. His legs were affected with the same spasmodic symptoms. His eye-lids were much contracted; and his hearing greatly impaired. It was with difficulty that he parted with his water; and he had no stools but what were procured by glysters. His neck and spine were rigid. He had the convulsion of the mouth, commonly called the *rifus cynicus*. The *gastrocnemii* and *abdominal* muscles were as tense as possible, and all his joints so stiff, as not to be moved without great violence.

I ENQUIRED whether he had received any hurt upon his fingers or toes, and was answered in the negative, but upon taking hold of his left hand, I discovered a little plaster upon the anterior part of his fourth finger. His friends informed me that the cause of this application was, indeed, a bruise which he had received, by a cask falling upon it about a month before, but the wound was very trifling; and that by  
the

the assistance of a gentleman in the neighbourhood, a surgeon and apothecary, it was so near well, that he had not the least inconvenience from it.

UPON removing the plaster, the finger appeared free from any inflammation or swelling, but had a little discharge of thin limpid matter, from an orifice so small, that it would but just admit the point of a very slender probe, upon the introduction of which I plainly perceived that the bones of the second and third phalanx were bare in the joint; and upon endeavouring to move the finger different ways, was satisfied that the ligaments were destroyed, and the use of the joint intirely lost.

THOUGH I was myself convinced, I could not, by any arguments, persuade either him or his friends, that his disorder was owing to this accident. He had continued well for three weeks, and had not the least return of pain in his finger, since the time the cask had fallen upon it.

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I BLED him, ordered a large blistering plaster to be applied to his back, gave him a vomit, and a purging draught, without any good effect, and administered glysters with very little better success. He took musk, bark, camphire, and valerian in large quantities, but to no purpose : Opiates alone seemed to mitigate his symptoms. I began by giving them in small doses, but increased them gradually, till he took a grain of opium every hour ; and this he continued doing for several days together, without getting by that means more sleep than usual. But these opiates procured only temporary relief, and when they were omitted, he relapsed into as bad a state as ever. I now represented to his friends that the taking off the end of his finger was the only method to preserve his life, which I apprehended to be in the most imminent danger. They at length consented, and I took off the last phalanx at the articulation, six weeks after the accident happened. His disorder nevertheless did not abate. This I supposed to be occasioned by some small splinter at the end  
of



of the stump, irritating the nervous system; and accordingly four or five days afterwards, as soon as the skin and tendons had contracted, and receded a little from the bone, I nipped off it's extremity with a pair of cutting pincers. His convulsive spasms were immediately both less severe and less frequent. I reduced the quantity of opiates by degrees, till, in about a month, his fits intirely left him. His jaw however remained so stiff, that he could but open it a little way; and the muscles of his belly and legs were so tense, that he could not walk without assistance. But these symptoms were soon removed by the use of the warm bath \* frequently repeated. He has ever since remained perfectly well, is now healthy and strong, and able to undergo any kind of fatigue, his constitution not being in the least impaired either by the

\* SINCE the publication of this case in the Medical Observations and Inquiries, I have found the warm bath of great service in the cure of the locked jaw, when opiates and many other remedies had failed. See *An Account of the topical Application of the Sponge*, p. 31.

opiates \* he had taken, or by the violence of so terrible and so continued a disorder.

As this malady had been so generally reputed mortal, I must acknowledge that it was the recital of the two cases in the Medical Observations and Inquiries, by a Society of Physicians in London, which directed me to pursue this method. This shews the great advantage resulting from the publication even of single cases, and will therefore, I hope, make any apology unnecessary for the trouble I have now given you. In the space of twenty years several cases of the same kind have happened in this town and neighbourhood, all of which proved mortal; but as none of them fell under my care, I can give no particular account of them.

\* HE took in about five weeks three hundred and seventeen grains of opium, besides several draughts, containing in them liquid laudanum, and syrup of poppies.

*An Account of a Case in which the upper Head of the Os Humeri was sawn off, a large Portion of the Bone afterwards exfoliated, and yet the intire Motion of the Limb was preserved. Read before the Royal Society, Feb. 9, 1769.*

EDMUND POLLIT, of Sterling, near Cockey-Moor, in this county, aged fourteen, of a scrophulous habit of body, was admitted into the Manchester Infirmary, April 6, 1768. The account I received with him was, that he had been suddenly seized, about a fortnight before, with a violent inflammation in his left shoulder, which threatened a mortification, but at last terminated in a large abscess, which was opened with a lancet a few days before his admission. The orifice was situated near the axilla, upon the lower edge of the pectoralis major, and through it I could distinctly feel the head of the os humeri, totally divested of it's bursal ligament. The matter, which was very offensive, and in great quantity, had made it's way down to the middle of the humerus, and had likewise  
burst

burst out at another orifice, just below the processus acromion, through which the head of the os humeri might easily be seen. The whole arm and hand were swelled to twice their natural size, and were intirely useless to him. He suffered much pain, and the absorption of the matter had brought on hectic symptoms, such as night sweats, diarrhœa, quick pulse, and loss of appetite, which had extremely emaciated him.

IN these very dangerous circumstances there seemed to be no resource but from an operation. The common one in these cases, that of taking off the arm at the articulation, with the scapula, appeared dreadful, both in the first instant, and in it's consequences. I therefore proposed the following operation, from which I expected many advantages, and performed it on the fourteenth of the same month. I began my incision at that orifice which was situated just below the processus acromion, and carried it down to the middle of the humerus, by which all the subjacent

cent



cent bone was brought into view. I then took hold of the patient's elbow, and easily forced the upper head of the humerus out of it's socket, and brought it so intirely out of the wound, that I readily grasped the whole head in my left hand, and held it there till I had sawn it off, (vid. fig. I.) with a common amputation saw, having first applied [a pasteboard card betwixt the bone and the skin. I had taken the precaution of placing an assistant, on whom I could depend, with a compress just above the clavicle, to stop the circulation in the artery, if I should have the misfortune to cut or lacerate it, but no accident of any kind happened, and the patient did not lose more than two ounces of blood, only a small artery which partly surrounds the joint being wounded, which was easily secured.

• He was remarkably easy after the operation, and rested well that night; the discharge diminished every day, the swelling gradually abated, his appetite returned, and all his hectic symptoms vanished. In about

five or six weeks I perceived the part from which the bone had been taken, had acquired a considerable degree of firmness, and he was able to lift a pretty large weight in his hand. At the end of two months I found that a large piece of the whole substance of the bone that had been denuded by the matter, and afterwards exposed to the air, was now ready to separate from the sound, and with a pair of forceps I easily removed it, (vid. fig. II.) After this exfoliation the wound healed very fast, and on August 15, he was discharged perfectly cured. On comparing this arm with the other, it is not quite an inch shorter ; he has the perfect use of it, and cannot only elevate his arm to any height, but can likewise perform the rotatory motion as well as ever. The figure of the arm is no ways altered, and from the use he has of it, and it's appearance to the eye and to the touch, I think I may safely say the head, neck, and part of the body of the os humeri are actually regenerated.

I DID

I DID not make use of any splints, machine, or bandage during the cure, to confine the limb strictly in one certain situation, nor was his arm ever dressed in bed, but sitting in a chair, and as soon as he could bear it, standing up with his body leaning forwards, to give room for the application of the bandages, which were no more than what was just necessary to retain the dressings; and to this method I attribute the preservation of the motion of the joint, which could not have been so well effected any other way, as the joint would in all probability have remained stiff, and formed an anchylosis, if it had not been allowed to play about.

#### R E M A R K S,

THOUGH from this operation I hoped for many advantages preferable to the amputation of the limb at the scapula, yet my most sanguine expectations fell greatly short of the success attending it. I did not flatter myself with the hopes of a moveable joint, or that the length of the  
limb

limb would be so nearly preserved, where there was a loss of above four inches of the whole substance of the bone, without any other bone to support it, as in the leg and fore-arm, and where the dreadful condition of the arm, at the time of the operation, prevented me from making use of any machine to keep it extended \*. But I suppose the weight of the arm was in this case in some measure sufficient to counterbalance the contractile power of the muscles, as his arm was only suspended by a common sling, and the patient not at all confined to his bed. I could not help being surprized to find so much strength and firmness, as evidently shewed a regeneration of the bone, before the lower part had exfoliated, or even before it had begun to loosen. The osseous matter could not proceed from the scapula, the glenoid

\* AFTER the extraction of three inches and ten lines of the os humeri, Mr. Le Cat made use of a machine to keep the upper and lower pieces of the bone at their proper distances. He has given a description of the case, and a figure of the machine in vol. 56 of the Philos. Transf. p. 270.



cavity of that bone not being divested of it's cartilage, could it then possibly escape from the end of the sound bone, before the morbid part had begun to separate from it? Or are there any vessels that could convey the boney matter, and deposit it in the place of what had been removed\*.

\* MR. GOOCH, in his volume of cases and practical remarks, relating the case of a compound fracture of the leg, where a very considerable portion of the tibia was sawn off, says, " In about three weeks  
 " I was sensible, as were also several surgeons, whom  
 " curiosity led to see so uncommon a case, that the  
 " substance which grew in the space of five inches  
 " intirely void of bone, had acquired in the middle  
 " only a greater degree of solidity than flesh, which  
 " circumstance not agreeing with the generally received  
 " notion of the generation of callus, we proved, be-  
 " yond dispute, with a sharp pointed instrument; and  
 " we observed that the ossification was gradually  
 " formed from that central point, which was consi-  
 " derably advanced before any exfoliation was cast off  
 " the ends of the divided bone. In less than four  
 " months the whole space was so well supplied with  
 " the callus, or rather new bone, that he was able  
 " to raise his leg, when the bandage was off, without  
 " it's bending."

Cases and Remarks, new edit. p. 287.

THESE

THESE are points that I will not pretend to decide absolutely, but I am much inclined to the latter opinion \*. Is it not probable that there was a regeneration of the cartilage as well as of the bone ? It is well known to every body conversant in anatomy, that not only the ends of some bones which are joined to no others are covered with cartilages, but that they are never wanting on the ends, and in the jointed cavities of such bones as are designed for motion, and I cannot see in this case how the motion could be preserved so complete without a cartilage ;

\* “ IN universum in sanguine materies est apta  
 “ producendo ossi, quæ adeo frequenter in cellulosum,  
 “ spatium intimum, interque convexam superficiem  
 “ membranæ intimæ musculosæ extremitatem, effun-  
 “ ditur, & caseosa primo, inde callosa quasi coriacea,  
 “ demum ossæ squamæ fit simillima.”

Halleri Elem. Physiol. tom. 8. p. 316.

“ CALLI in ossibus non fracturas solas, sed omissa  
 “ integra ossa sarcientes, fiunt ex liquido glutinoso,  
 “ pulsu proximarum arteriarum compacto,” &c.

Halleri primæ lineæ, p. 148.

SEE further, Haller's Pathological Observations,  
 obs. 47.

and indeed without a burfal ligament, or something analogous to it, to contain the fynovia, and keep the bone in it's place.

As this is the first operation of the kind that has been performed, or at least made public, I thought the relation of it might possibly conduce to the improvement of the art. That ingenious surgeon, Mr. Gooch, has indeed related three instances of the heads of bones being sawn off in compound luxations. In one of these cases the lower heads of the tibia and fibula were sawn off, and in another that of the radius, and in the third that of the second bone of the thumb, but these were in many respects different from the present case. I believe it will seldom happen that this operation will not be greatly preferable to the amputation of the arm at the scapula, as this last is generally performed for a caries of the upper head of the os humeri, and as the preservation of a limb is always of the utmost consequence, and what every surgeon of the least humanity would at all times wish for, but particularly

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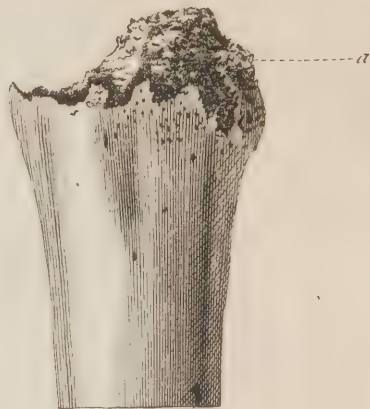
where,

where, as in this case, the whole limb, and it's actions, are preserved intire, the cure no ways protracted, and the danger of the operation most undoubtedly less. For though amputation is often indispensably necessary, and frequently attended with little danger or inconvenience when only part of a limb is removed, yet where the whole is lost, the danger is greatly increased, and the loss irreparable.

I HAD frequently performed this operation upon dead subjects, and where the parts had not been diseased, and never found any difficulty ; and from a dissection of the parts had no reason to doubt of success in a living subject, where the ligaments and muscles are more supple, and the matter, by insinuating itself betwixt the bone and integuments, has made less dissection necessary. I have likewise, in a dead subject, made an incision on the external side of the hip joint, and continued it down below the great trochanter, when, cutting through the burfal ligament, and bringing the knee inwards, the upper  
head



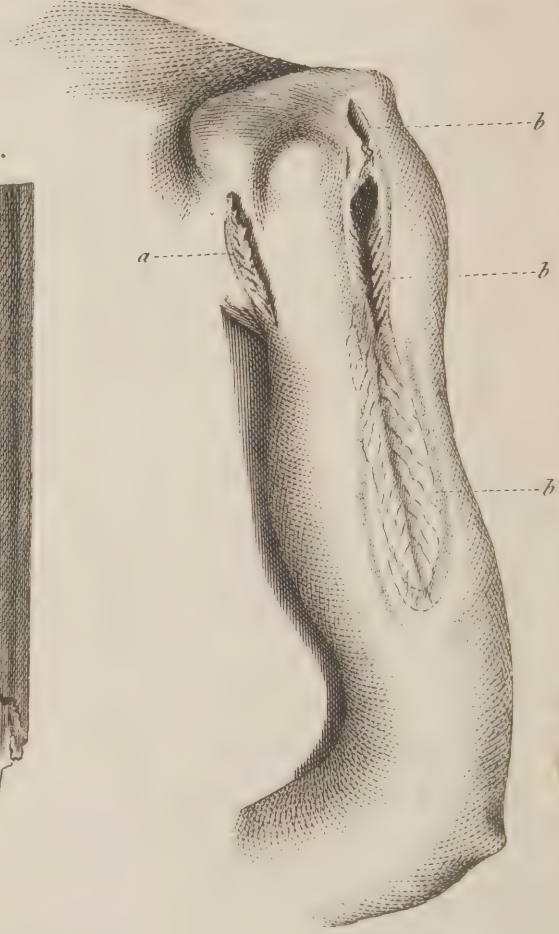
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*





head of the os femoris hath been forced out of it's socket, and easily sawn off; and I have no doubt but this operation might be performed upon a living subject with great prospect of success.

THE Royal Academy of Surgery at Paris, proposed for a prize question, whether amputation of the thigh, at it's articulation with the os innominatum, was ever adviseable; but, was I under a necessity of performing this operation, or that which I have been describing, I should not hesitate a moment which to prefer.

I HAD the honour of shewing to the Royal Society the bones which were taken from the boy's arm, at the time this paper was read, and they are now deposited in their museum.





*An Account of a remarkable Operation on a broken Arm, communicated to the Royal Society, and inserted in their Philosophical Transactions for the Year 1760.*

**R**OBERT ELLIOT, of Eyham, in Derbyshire, a very healthful boy of nine years old, had the misfortune, about Midsummer, in the year 1759, by a fall, to fracture the humerus, near the middle of the bone. He was immediately taken to a bone-setter in that neighbourhood, who applied a bandage and splints to his arm, and treated him as properly as I suppose he was capable of for two or three months. His endeavours, however, were by no means productive of the desired effect, the bones not being at all united. A surgeon of eminence, in Bakewell, was afterwards called in ; but as he soon found he could be of no service to him, and as the case was very curious, he advised the lad's friends to send him to the Infirmary at Manchester. He was accordingly brought thither the Christmas following, and admitted an in-patient. Upon examination

we found it to be a simple oblique fracture, and that the ends of the bone rode over each other : his arm was become not only intirely uselefs, but even a burthen to him, and not likely to be otherwise, as there was little probability that it could ever unite, it being now fix months since the accident happened.

AMPUTATION was therefore propofed as the only method of relief ; but I could not give my consent to it, for as the boy was young, and had a good conftitution, it was hardly poffible that it could be owing to any fault in the folids or fluids, but that either nature was difappointed in her work by frequent friction, while the callus was forming, or rather, that the oblique ends of the bone, being fharp, had divided a part of a mufcle, and fome portion of it had probably infinuated itfelf betwixt the two ends of the bone, preventing their union. Which ever of thefe might be the cafe, I was of opinion, that he might be relieved by the following operation, viz. by making a longitudinal incifion

cision down to the bone, by bringing out one of the ends of it, which might be done with great ease as the arm was flexible, and cutting it off, either by the saw or cutting-pincers, then by bringing out the other, and cutting off that likewise, and afterwards by replacing them end to end, and treating the whole as a compound fracture.

THE objections made by the other gentlemen concerned, to this proposal, were, First, The danger of wounding the humeral artery by the knife. Secondly, The laceration of the artery by bringing out the ends of the bones. And Thirdly, That we had no authority for such an operation. As to the first, that was easily obviated, by making the incision on the side of the arm, opposite to the humeral artery. The place of election appeared to me to be at the external and lower edge of the deltoid muscle, as the fracture was very near to the insertion of that muscle into the humerus; the danger of wounding the vessel not only being by that means

avoided, but, after the operation, while the patient was confined to his bed, the matter would be prevented from lodging, and the wound be easily come at, to renew the dressings. The second objection will not appear to be very great, when we consider that in compound fractures the bone is frequently thrust with great violence through the integuments, and seldom attended with laceration of any considerable artery; and as this would be done with great caution, that danger would appear very trifling. The third and last objection is no more than a general one to all improvements.

THIS method which I have been proposing, was at last resolved upon, and I assisted in the operation, which was performed, by a gentleman of great abilities in his profession, on January 3, in the present year. The patient did not lose above a spoonful of blood in the operation, though the tourniquet was not made use of. When the operation and dressings were finished, the limb was placed in a fracture-box,



box, contrived on purpose, the lad confined to his bed, and the rest of the treatment was nothing different from that of a compound fracture.

THE wound was nearly healed in a fortnight's time, when an erisipelas came on, and spread itself all over the arm, attended with some degree of swelling; this by fomentations, and the antiphlogistic method, soon went off, and the cure proceeded happily, without any other interruption. In about six weeks after the operation the callus began to form, and is now quite firm. The arm is as long as the other, but somewhat smaller, in consequence of such long continued bandages; he daily acquires strength in it, and will soon be fit to be discharged.

*A fractured*



*A fractured Thigh, attended with uncommon Circumstances.*

**J**OSEPH GODWIN, a farmer, at Thorncliffe, near Leek, in Staffordshire, betwixt forty and fifty years of age, on June 6, 1768, had the misfortune to fracture his thigh-bone about the middle. Mr. Cope, a very ingenious surgeon at Leek, was immediately sent for, who treated it with greatest propriety: but about six weeks after the accident it was discovered not to be at all grown. It was again secured with a bandage and splints, and the patient still ordered to be confined, but with no better success, for, at the expiration of six months, it was in the same situation.

I was then consulted, and informed that the patient was quite tired out, and very desirous of having the limb taken off, if no other method could be thought of to make the bone unite. I advised a case to be made of strong leather, jacked so as to be very stiff, commonly called Ben-leather

leather, of such a length that the upper end should rest against the pubis, ischium, and ilium, and the lower on the inferior apophysis of the thigh-bone, by which, when it was laced on, the thigh might be kept extended. I also recommended it to the patient to get out of bed, and by the help of this case and crutches to endeavour to walk. He began this method on November 10. At the end of December, near seven months after the accident happened, it could not be said that the bone was at all grown, but soon after that time the callus began to form, and was perfected by the beginning of February. After he had worn this case some time, his thigh began to swell, and at last a large abscess appeared, which was opened by Mr. Cope, on February 21, and contained two or three quarts of matter. On introducing my fingers into the wound, I distinctly felt the two ends of the bone, which were broken transversely, riding over each other, but perfectly united. The patient was brought very low by the discharge, but by the use of the bark, and  
light



light nourishing diet, he recovered in a few weeks, and is now able to walk many miles in a day, without the least assistance.

### R E M A R K S.

THE non-formation of the callus at first, in this case, as well as in the preceding one, I imagine is to be attributed to some intervening substance, which had prevented the divided parts of the bone from coming into contact: for, it is a fact well known, that a callus will form whether the fracture be transverse or oblique, if only the sides of a bone be brought together, though the ends of it do not so much as touch each other.

I HAVE some bones in my possession, particularly a thigh-bone, which prove this. There are likewise several instances of bones uniting, when no part has come into contact, but the callus has shot several inches, and I believe this will generally happen if there be nothing to obstruct it.

In

In the present case I apprehend that the leather thigh-case being laced on tolerably tight, pressed the sides of the bone against the intervening substance, which, together with the friction arising from his attempts to walk, brought on inflammation and suppuration, which destroyed it, and thereby gave the callus room to shoot. I am the more inclined to believe this happened, as there was no sign of an abscess, or swelling at the time he began to wear the case, and when the abscess was opened, the bone lay bare for a considerable length, covered only by it's periosteum.

*An Account of an Operation successfully performed upon a broken Leg, in which the fractured Tibia was not united, though thirty-six Weeks had elapsed after the Accident.*

**J**AMES PICKUP, a very healthy, active man, aged twenty-three years, broke his leg by a fall on February 18, 1769. A bone-setter, near Rochdale, was immediately sent for, under whose management he remained till October 9, following, upwards of thirty-three weeks, when he was admitted an in-patient of the Manchester Infirmary, and fell under my care. Upon examining the leg very attentively, I found that it was an inch shorter than the other, and that there had been a \* simple oblique fracture of both the bones, about four inches above the ankle joint.

\* SOME authors have divided fractures into simple, compound, and complicated, but I use the term simple in the sense in which the English have always used it, viz. whether one or more bones be broken, provided it is not complicated with a wound.

The

The broken parts of the fibula were united, but those of the tibia were so far from being in the same condition, that they were perfectly loose, and moveable. The fractured ends of the tibia, as well as of the fibula, rode over each other, and seemed never to have been properly coaptated. The leg was intirely uselefs, and my patient was not able to move about without crutches.

I THOUGHT it extremely probable that an operation somewhat fimilar to that which was performed upon Robert Elliott, would be attended with the like fuccefs. But as there was no neceffity for it's being performed immediately, and, as in some circumstances, Pickup's cafe was different from that of Elliott, for the prefent, that I might have time to make proper obfervations, and lay down a fuitable plan for my future conduct, I only applied fresh bandages, and confined him to his bed. Elliott's fracture was of the humerus, and that bone being fupported by no other, his arm was perfectly flexible; confequently the



ends were easily turned out of the incision, and cut off with ease. But in this case there were two bones, the fracture of the fibula was united, and I was prevented from bringing out the broken ends of the tibia. Some variation was therefore necessary to be made in my mode of operation.

My patient was willing to undergo any thing that might conduce to the recovery of his limb; and, upon the first of November, I proceeded in the following manner :

I MADE a longitudinal incision, about four inches in length, through the integuments which covered the fracture. This discovered to me the superior extremity of the broken bone, a little pointed, covered over with a substance perfectly smooth, and in every respect resembling the extremity of a bone tipped with a cartilage. No sign of a callus appeared. By the application of a very large crown

G

of

of a trephine, I easily cut off the end. This brought the \* inferior part of the fractured bone more into view, and it appeared to be no easy matter to cut off the end of it, without putting my patient to much pain, and probably exposing his life to some danger; but as I did not doubt that every impediment to the formation of a callus might now be removed without it, I contented myself with scraping off the periosteum from the inferior part of the bone, and ordered him to be put to bed, after I had filled the wound with dry lint, and had applied the common dressings and banda-

\* My good friend Mr. Pott, who has, in all his treatises, written with so much precision, clearness, and perspicuity; in his general remarks on fractures, and dislocations; has observed, in p. 59, that "If the tibia and fibula be both broken, they are both generally displaced in such a manner, that the inferior extremity, or that connected with the foot, is drawn under that part of the bone connected with the knee;" which observation was verified in this case.

ges \*, his knee being a little bent, and his leg and foot lying on their outside.

He rested tolerably well. The inflammation and swelling which succeeded were so trifling as not to merit notice. I kept the wound well dilated, sometimes with sponge, and sometimes with dry lint. About a week after the former operation I took off, with the cutting-pincers, a small angle of the bone which had been left by the trephine, and touched the inferior part of the bone with butter of antimony. This I also introduced between the fractured extremities, in order to destroy a substance which prevented

\* This method of treating fractures is more fully described by Mr. William Sharp, in vol. 57 of the Philos. Trans. part 2, 1767; by Mr. Pott, in his treatise on fractures and dislocations; and by Mr. Wathen, in his treatise intitled the Conductor, and containing splints. The first mentioned gentleman did me the honour, sometime ago, to send me some of his splints, which I have made use of with great advantage to my patients. This position of the limb is what my father constantly used in fractures of the thigh for forty or fifty years past.

their being brought into immediate contact. I repeated this application three or four times, at proper intervals. A trifling exfoliation ensued. My patient began to mend, and his recovery had no interruption. In about nine weeks after the operation he walked with only the assistance of a stick, in twelve weeks the wound was perfectly healed, and the bone firmly united, and he was discharged from the Infirmary January 22, 1770. To the recital of this case I must beg leave to add the remarks which follow: Cases of fractured bones which refuse to be united, though unattended with wounds of the integuments, and where the patients are both young and healthful, are more common perhaps than is generally imagined. Besides the three I have already related I have seen four others of a similar nature; two of them of the humerus, one of the fore-arm, and the other of the leg. In these the fractures were of many, one of them more than twenty, years duration, and the bones had never been in union.

THE



THE Baron Van Swieten, in his Commentaries upon Boerhaave's aphorisms, sect. 346, tells us, " he had himself seen a woman who, having broken her arm, had it reduced according to art, but that it never united, though she was in the flower of her age, continuing flexible in the broken part during the remainder of her life, without any great inconvenience to her."

RUYSCH, in his advers. anatom. decad. 2, numb. 2, p. 6, says, " he has met with a case where the bones would not unite, even though all the proper rules of art were observed towards obtaining a cure." And, in his Observations anatomical and chirurgicall, obs. 4, p. 8, he relates " that in the body of a man who was hanged in full health, he found two of the anterior bones of the carpus not yet conjoined, even though they were fractured three years before."

TURNER, in his treatise intituled the Art of Surgery, vol. 2, p. 153, gives us

the following history : “ A gentleman’s  
 “ coachman, then of St. Helen’s parish,  
 “ within Bishopsgate, by a kick from one  
 “ of the horses, had the humerus broke  
 “ off in the middle, betwixt the cubit  
 “ and the top, articulating with the scapula,  
 “ upon which, after the reduction, I con-  
 “ tinued him in his bed, and, at ten days  
 “ end, finding all things appear well for  
 “ the time, dressed up again, with a mild  
 “ cerate, instead of the defensative I had  
 “ applied at the first dressing, still per-  
 “ suading him to keep his bed, yet grant-  
 “ ing a larger liberty in his diet : but at  
 “ three weeks end, whether from any  
 “ error therein committed, or getting cold  
 “ in his rising, although I rather think  
 “ it was an effect of his ill habit of body,  
 “ or scorbutic dyscrasy of the juices of his  
 “ blood, he fell into a flux of the belly,  
 “ which, notwithstanding all endeavours  
 “ by an *elect. ex conf. rosar. confect.*  
 “ *fracast. pulv. rhei. torrefact. coral. p. p.*  
 “ with a *decoct. c. c. c.* for his drink,  
 “ and other methods prescribed by his  
 “ physician, so prevented our endeavours

to

“ to unite and confirm the callus, that at  
 “ six weeks end, a sufficient term for con-  
 “ solidating the largest bone in a human  
 “ body, when we thought all safe, one  
 “ evening, when he was helped off with  
 “ the waistcoat sleeve on that side, it  
 “ seemed to him that his arm was falling  
 “ to pieces: however, being still kept  
 “ tight and close by the splints and bandage,  
 “ he went to bed ; and the next morning,  
 “ throwing his cloaths over his shoulders,  
 “ in great surprize came to my house,  
 “ where I had no sooner loosened the dress-  
 “ ings but I found plainly the callus was  
 “ intirely dissolved, the arm swinging back-  
 “ wards and forwards, as if there had  
 “ never been any stay or stability besides  
 “ the muscles. I was indeed as much  
 “ alarmed myself, and did all in my power  
 “ to retrieve the poor fellow’s misfortune,  
 “ dressing it up with a *catagmatic empl.*  
 “ of the *stypt. paracels. diapalm. ad bern.*  
 “ with some of the conglutinating species  
 “ melted down therewith, directing, at the  
 “ same time, the *pulv. osteocol. cum syrup.*  
 “ *de symphito* for some weeks longer.

“ AT length finding all to little or no  
 “ purpose, his master, Mr. Prideaux, sent  
 “ him to St. Thomas’s, where, after  
 “ other ineffectual attempts for his reco-  
 “ very, I understood that Mr. Rydout,  
 “ whose patient he was, whipped off the  
 “ useless limb in the interstice of the  
 “ broken extremities without more to do ;  
 “ and, healing up the stump, dismissed  
 “ him : his master procuring for him a  
 “ letter-carrier’s place, by which he sub-  
 “ sisted several years till his death.” And  
 the ensuing observation we have from  
 Du Verney \* : “ A man, in falling, frac-  
 “ tured the fore-arm four fingers breadth  
 “ from the wrist, so that both the radius  
 “ and ulna were broken transversely, and  
 “ totally divided. Surgeons were imme-  
 “ diately called to reduce this fracture,  
 “ but the man would not allow himself  
 “ to be touched, and told them he should  
 “ be cured without their assistance and  
 “ bandage. He went about his business

\* PAGE 174, Eng. edit. by Ingham.



“ as usual, and made use of his arm and  
 “ hand as much as he possibly could.  
 “ At length by these frequent motions  
 “ the ends of each cemented separately.  
 “ They were bound by membranes, that  
 “ were prolongations of the neighbouring  
 “ parts,” &c.

I COULD produce more instances of this  
 sort, but as they were complicated with  
 wounds of the integuments, they are not  
 directly to the point; therefore do not fall  
 under our notice at this time.

CELSUS appears to me to have spoken  
 more intelligibly upon this subject than  
 any other author, either ancient or modern.  
 Indeed he is the only person who has pro-  
 posed any remedy for this terrible misfor-  
 tune, which, as it is intirely local, can  
 only be removed by manual operation: he  
 says, “ When the bones happen not to  
 “ unite, because they have been often  
 “ opened, and often moved, the method  
 “ of cure is obvious; for they may unite,  
 “ if

“ if the fracture be of long standing. The  
 “ limb must be extended, to create a fresh  
 “ injury ; the bones must be separated  
 “ from one another by the hand, that  
 “ their surfaces may be roughened by  
 “ rubbing against each other, and if there  
 “ be any fat substance it may be abraded,  
 “ and the whole of it become, as it were,  
 “ recent ; great care however must be taken  
 “ not to wound the tendons or muscles.”

He is certainly rather too concise in his  
 directions ; but for this I dare not venture to  
 blame him, since it does not appear he had  
 ever either practised this method himself,  
 or seen it performed by others. Indeed we  
 are far from being certain that he ever was  
 a practitioner of the healing arts ; his pro-  
 fession being to this day the subject of cri-  
 tical inquiry ; but his medical performances  
 have been at all times read with attention,  
 and will merit the admiration of the faculty.  
 I know of no improvements made upon  
 the hint which he has given us. The  
 passage has, it is true, been repeatedly  
 quoted

quoted. Du Verney, p. 175, \* has given his reasons against it, but I cannot find that either the plan which he laid down has been at any time adopted, or any other substituted in it's room by his successors. The unhappy patients have been obliged to submit to the inconveniencies attendant upon the non-union of the fractured bones, or, what has been still worse, to the amputation of the limbs themselves.

THE junction of Goodwin's thigh was certainly perfected upon the plan laid down by Celsus, I mean by friction; though his mode of operation was not

\* “ BUT if from any cause whatever the ends of  
 “ each bone should be reunited separately, to obviate  
 “ this inconvenience, the callus being recent, it is re-  
 “ commended that both ends of the fractured bones be  
 “ rubbed against each other, in order to wear and de-  
 “ stroy the extremities of the boney fibres, to facilitate  
 “ the nutritive juices cementing them together by a  
 “ fresh callus; but this operation is only good in the  
 “ study; for however the whole end of the cemented  
 “ bone be rubbed, it is useless, and even dangerous,  
 “ for the patient.”

exactly

exactly followed. He suffered however more than either Elliott or Pickup, and was brought so exceedingly low, by the discharges he underwent, as to cause me some uneasiness. For these reasons I must give the preference to the other two, where it can be complied with. I can, with satisfaction, add that after the operations themselves were over, I never had less trouble with patients labouring under the most trifling compound fractures. I must further assert, that as far as can be determined from these instances, the operations themselves are attended with as little danger, and as much certainty of success, provided the patients are in health, as any of those usually performed in the principal cases of surgery; but if these accidents originally owe their rise to scorbutic or venereal complaints, those complaints must be first removed by medicines and a proper regimen; and should the patient be a female, and with child, it seems adviseable to defer this process till some time after her delivery, as, in that case the

fractured



fractured bones may perfectly unite \* of themselves.

WHEN these accidents indeed are to be attributed to extreme old age, or a general fragility of the bones, every attempt towards a cure will, I am afraid, be unsuccessful.

\* SEE Hildan. Oper. cent. vi. obs. 68, p. 582.  
Misc. Curios. decur. 1. a. 1. obs. 25, p. 91.

the first of the year, and the  
 second of the year, and the

third of the year, and the  
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nineteenth of the year, and the  
 twentieth of the year, and the  
 twenty-first of the year, and the

*An Account of a new Method of reducing Shoulders, which have been several months dislocated, without the use of an Ambe, in cases where the common Methods have proved ineffectual, published in the Medical Observations and Inquiries. Vol. II.*

P. 373.

**M**R. LONGWORTH of Longworth's folly in Manchester, aged sixty, applied to me about the year 1748, to reduce a dislocation of his right shoulder, which had happened two months before, and upon which several unsuccessful attempts had been made by a surgeon of extensive practice and great experience, under whose care he was put immediately after the accident. Upon examining him I found that the head of the humerus had passed beyond the coracoid process, and lay under the pectoral muscle; a situation generally attended with a great deal of trouble.

I ATTEMPTED

I ATTEMPTED, but without success to reduce it by the means of \* pullies and bolsters, keeping the arm at a right angle with the body ; and afterwards made some ineffectual trials with the heel in the armpit. Both these methods are recommended by most writers on this † subject and are generally successful.

My want of success hitherto put me upon considering whether the capsular ligament might not have been lacerated, when it was upon it's full stretch, the head of the bone passed through the laceration, and the ligament itself collapsed about it's neck. I apprehended that if this was the case, the only method could be, to put the limb into the same position it was in when the accident happened, and in that position to make an extension. But

\* FORMS of these pullies may be seen in Scultetus, Vitruvius, Heister, and Desaguliers.

† WISEMAN, Parey, Manget bib. chirurgic. Turner, Heister, Petit, and Fabricius ab aqua-pendente.



as my patient was very much in liquor at the time he got his hurt, he was not able to give me the least information about the manner of his receiving it. I was however satisfied from the nature of the articulation, from the disposition of the acromion and coracoid processes, and of the strong broad ligament that is stretched between them, that the luxation of this joint is scarcely possible, whenever the arm makes an acute angle with the trunk of the body, so that this accident must have happened either, when the arm made an obtuse angle therewith or more probably when it was raised so high, as to be nearly in an erect position. I therefore proceeded in the following method.

HAVING screwed an iron ring into a beam at the top of the room, I fixed one end of my pulleys to it, and fastened the other to the dislocated arm by ligatures about the wrist, placing the arm in an erect position. In this manner I drew up my patient till his whole body was suspended; but that too great a force might

H

not

not be sustained by his wrist, I directed at the same time, two other persons to support his arm above the elbow. I now attempted to conduct the arm into it's place with my hands, when feeling it give way, and hearing it snap, I concluded it must have returned into it's socket, and ordered him to be taken down as carefully as possible.

I FOUND the bone had only somewhat changed it's situation, the head of it having approached near to the axilla. This however gave me hopes that I was right in my conjectures, that it had passed through a laceration of the burfal ligament, and that it was now brought back, and might be reduced by any of the common methods of operation. I accordingly tried the heel in the armpit, and the bone returned to it's place with the greatest facility. My patient in a few weeks recovered the perfect use of his arm, and has not since suffered from it the least inconvenience.

## C A S E II.

JOHN ROOBOTHAM, of Macclesfield in county of Chester, a remarkable strong man, of betwixt thirty and forty years of age, had the misfortune in the year 1749 to dislocate his left shoulder. The reduction of it had been attempted by several surgeons in the town, and I was not applied to till three months after the accident happened. The vacuity beneath the processus acromion, the tumour in the axilla, and the distance of the elbow from the body, which could not be diminished without occasioning the greatest pain, satisfied me immediately of the reality of the luxation.

I FASTENED his arm to the pullies, as in the former case, and drew him up till his whole body was raised from the ground, when the bone instantly slipped into it's socket. No other violence was used than what is here mentioned, the whole of the operation did not take up

more than a minute; and the free use of his arm was recovered in a short time after.

### C A S E III.

JAMES DAWSON, of Leigh in this county, aged thirty-five, was admitted into our infirmary, September 29, 1760, and put under my care, for a violent blow which he had received a fortnight before upon the anterior and superior part of his shoulder, when his arm was raised.

It was dislocated in a very extraordinary manner; he had little or no pain either upon the place upon which he received the blow, or in any part of the joint. The pain, though very great, was confined to about four fingers breadth below the articulation, exactly where the deltoid muscle is inserted into the humerus. His arm lay close to his body: the least elevation of it increased his pain, and the head of the bone was forced under the scapula, of which I was made sensible,  
by



by perceiving it's lower angle to be somewhat pushed outwards.

I TRIED in vain the common methods of reduction, especially that of the heel in the armpit. I had not now the pullies with me, for which reason I ordered three or four strong men to stand upon a table, and to raise the patient up by his dislocated arm, placing it in an erect position, till his whole body should be suspended. As I endeavoured to help the head of the bone into it's socket, I perceived it to give way considerably; and found, upon letting him down, that though it was not in it's place, it had changed it's situation, and was intirely in the axilla. From this I concluded it would now very easily be reduced, and upon my first repetition of the heel in the armpit, after I had laid him upon the ground, it returned into it's place immediately. His pain instantly ceased, and in a few days he was perfectly well.

## R E M A R K S.

I HAVE reduced, by the same method, a few other dislocations of the humerus, but as there was nothing relative to any of them materially different from some of the preceding cases, it will be unnecessary to trouble you with the particulars.

IN the second case the reduction was perfected by this new mode of operation alone, instantly, with the greatest ease, and that three months after the dislocation had happened. And I must beg leave to observe, that though, in two of the above cases, the reduction was not intirely finished by this method, yet as it was afterwards accomplished by the means which had been before unsuccessfully tried, I cannot help attributing my success to the making the extension when the arm was raised, and thereby bringing back the head of the humerus through the capsular ligament. And I am the more confirmed in this opinion, as the situation of the  
bone

bone was considerably changed by these extensions.

THE last is a case which very rarely occurs, I never saw it before, nor do I remember to have met with it in any author except Heister, who tells us, "That the head of the bone may often be dislocated under the armpit, sometimes forwards, sometimes backwards, and even below the scapula." I am far from thinking that his meaning is sufficiently clear, but, in all probability, he alludes to the same kind of dislocation. This reduction was performed in the public Infirmary, not only in the presence of several pupils, but of gentlemen eminent for their skill in different branches of physic, who, I dare say, will be willing to subscribe to my opinion, that it was owing to my removal of the head of the humerus from under the scapula, by the extension of the arm in an erect position.

I SHALL only further observe, that this method is in reality attended with much less pain than many others which are frequently practised, notwithstanding it may seem severe to persons unaccustomed to operations of this nature. For as no force is used about the shoulder to make a counter-extension, the patient does not suffer from those troublesome excoriations and contusions which but too commonly attend the other methods. And I am every day more and more convinced, that a much less force will be necessary than what is generally used, not only in cases similar to those above recited; but in dislocations of other joints, if a proper regard be paid to the nature of the articulation, and to the position of the limb at the time when the accident happened.



*A Supplement to the preceding Cases.*

**M**R. H—, of Bolton, a strong, robust, middle-aged man, had the misfortune on June 11, 1762, to dislocate his shoulder in such a manner that the head of the bone was forced under the pectoral muscle. The accident happened in the morning, and different methods were made use of by three surgeons in order to its reduction. In the evening of the day I was sent for. I ordered an iron ring to be made, so as to screw into a beam, to which I intended to fix my pulleys; but before the smith could finish his work was desirous of reducing it, if possible, by some other method. I accordingly caused three or four strong men to suspend the patient by his dislocated arm, after the manner described in the preceding cases, but without effect. The heel in the armpit was afterwards tried with as little success.

HAVING inquired particularly into the circumstances of the accident, and the position

position of his body at the time he received it, he informed me he had hold of an horse's head, that the horse threw it upwards, and from him, so that his arm, at the same time that it was raised, was pulled backwards, and in such a manner, that though his elbow was elevated above his head, the position of his arm was not intirely perpendicular. The iron ring being finished, and screwed into the top of the beam, I ordered one end of my pullies to be fastened to it, and fixed the other to his wrist. I then directed him to sit down upon the floor, not directly under the ring, but at three or four feet distance, with his back rather turned towards it, so that when I should begin to use the pullies, his arm would be raised to something more than an angle of forty-five degrees, and pulled a little backwards. My intention was to put the arm as nearly as I could into the posture it was in when the accident happened. In this position I made an extension. The head of the bone glided with the greatest facility into it's socket, not returning with a sudden shock,

shock, as is generally the case. The extension was so very gentle, that though the patient was not so much as supported by any person, yet he was not in the least moved from the place upon which he sat, and the whole operation was performed in a few seconds, with less pain than usually attends the mere handling of a dislocated shoulder.

I WAS confidently of opinion that the reduction would be effected by this method, and yet I own the ease with which it was performed agreeably surprised me.

I HAD only applied one hand to the cord, and drawn it gently, when I perceived the humerus to give way the moment the arm was raised to a proper height. Whether the laceration of the bursal ligament is always the grand obstacle to reduction, I will not take upon me to determine; but I flatter myself this case will help to prove what I sometime ago advanced, that the most probable means to effect the reduction  
are

are to put the dislocated limb into the position it was in when the accident happened, and in that position to make an extension. Messieurs Mather, Lancaster, and Dutton, surgeons in Bolton, were present at the reduction.

NOTE, I have reduced a dislocated shoulder in an adult subject without any extension, merely by putting the arm into a proper position, when it instantly slipped into it's socket, without any other assistance than that of it's own muscles.



*Appendix to the Papers on Dislocations  
of the Humerus.*

**M**R. THOMSON, Mr. Pott, and Mr. Kirkland all agree, that in reducing dislocations of the shoulder the fore-arm should be bent. Mr. Pott says, \*  
 “ the fore-arm should at all times, let the  
 “ method of dislocation be what it may,  
 “ be bent, viz. because of the resistance of  
 “ the long head of the biceps in an ex-  
 “ tended posture.” I have so great an  
 opinion of the abilities of the above  
 named gentlemen, that I cannot differ  
 from them in any points of practice with-  
 out pain, and even without almost sus-  
 pecting my own judgment. The opinion  
 of these gentlemen seems to be founded  
 upon the case of a man who died in the  
 London Hospital, which is related by Mr.  
 Thomson, in the second volume of *Medical  
 Observations and Inquiries*: he says, “ Upon  
 “ dissecting the parts, the deltoid muscle

\* GENERAL Remarks on fractures and disloca-  
 tions, p. 120.

“ was observed to be considerably stretched  
 “ and tense, thereby occasioning the ap-  
 “ pearance of a curvature of the middle  
 “ of the arm, by the head of the hu-  
 “ merus being removed so far from it’s  
 “ natural place. The coraco-brachialis was  
 “ a little tense, but the broad head of the  
 “ biceps connected with it was relaxed;  
 “ the long and round head of this last  
 “ named muscle arising from the neck  
 “ of the scapula, near the upper edge  
 “ of it’s cavity, and which in a sound  
 “ state crosses the joint, and passes along  
 “ a groove formed for that purpose in the  
 “ head of the humerus, to be joined by  
 “ the other head, made a large curvature,  
 “ and thereby being violently stretch-  
 “ ed and distorted, occasioned an insur-  
 “ mountable flexion of the fore-arm. A  
 “ proof of the impropriety of making  
 “ any manner of extension in these cases  
 “ of the fore-arm, which ought to be  
 “ bent as much as possible, to relax that  
 “ part of the biceps which might other-  
 “ wise have been an hindrance to the re-  
 “ duction.” That this tendon of the biceps  
 should

should sometimes be stretched and distorted is not to be wondered at, owing to the peculiar manner of it's passing through the articulation, and being connected with the head of the os humeri, and therefore must be carried along with it whenever it is displaced, but that it should constantly and invariably occasion that insurmountable flexion of the fore-arm is by no means a fact, as I have never once met with that circumstance, either before or after reduction, though considerable force had been used ; but it must be observed, that that force was not used suddenly, but increased gradually ; whenever that happens to be the case, which I believe will be but rarely, it would not be adviseable to extend that muscle too much as it might increase the inflammation ; however I cannot see how it can possibly be an hindrance to reduction, but rather an advantage ; for as that tendon of the biceps is fixed to the upper part of the acetabulum, and passes through the articulation, to be lodged in the deep fossa of the os humeri, and is tied down by a tendinous sheath across the fossa, any exertion of that tendon must help to raise the head of the bone into it's place  
when

when a sufficient extension is made. And if the other head of the biceps, which is fixed to the coracoid process, should be stretched at the same time, they would bring the upper part of the acetabulum downwards, and forwards, which would also facilitate the reduction. But I am apprehensive that the bending of the forearm, at the time we are attempting to reduce the shoulder, will occasion a much greater obstacle than this imaginary one, by stretching the muscle called *anconæus major*, vel *extensor cubiti longus*, which is fixed above by a short tendon to the inferior impression in the neck of the scapula, and to a small part of the inferior costa of that bone, and is inserted below into the hinder part of the olecranon. This resistance will also be very much increased by the extension being made with ligatures applied above the elbow, consequently over the tendon of that muscle, and if this muscle is extended, it must bring the lower edge of the acetabulum scapulæ forward, and I believe every surgeon endeavours as much as possible to keep it back;





tions that have resisted every method ; however, at the same time I must add, that in all probability the reductions were impracticable, as they were of long standing, and have not since been reduced by any other person : and I must here declare, that in all those in which I had the happiness to succeed, the arm was stretched out at full length, and in many cases, where great force was not necessary, the whole extension was made from the wrist ; and when greater force was necessary, I divided it as much as possible by placing assistants at different parts of the arm, in order to make the extension. I have indeed tried to reduce these obstinate dislocations of the shoulder, with the fore-arm bent, but without success.

PETIT, Du Verney, and many others, say, “ that in dislocations in general, the

ing a new method of reducing dislocations of the shoulder, I have had numerous applications made, many of them from distant places, and consequently it is not to be wondered that some incurable cases should have offered.

extensions

“ extensions and counter-extensions must  
 “ be made upon those very bones that  
 “ are disjoined, and not upon those next  
 “ to them; as all the force which is  
 “ applied to the bone below must neces-  
 “ sarily be lost in the articulation which  
 “ is not luxated, and be of little or no  
 “ service to that which is; and this is  
 “ owing to the yielding nature of the  
 “ ligaments of the joints. For instance,  
 “ if the luxation of the arm was to be  
 “ reduced, one must pull the arm itself,  
 “ not the cubitus; thrust back or with-  
 “ hold the shoulder, and not the body;  
 “ because that part of the force would  
 “ be lost in the articulation of the elbow,  
 “ and in the adhesion of the omoplata.”

THOUGH this doctrine may be true  
 with regard to dislocations in general, and  
 indeed to those of the shoulder with re-  
 gard to the scapula, the lower part of  
 which should be steadily with-held, yet  
 I believe those who consider the nature  
 of the articulation of the elbow, will  
 agree with me, that this joint cannot give

way much by any common force when in an extended position, as the olecranon is then lodged in the posterior deep triangular cavity of the os humeri. This position gives an opportunity to the assistants of applying their hands to different parts of the arm in making the extension, by which means ligatures seldom become necessary; but when the force is applied to the lower part of the os humeri only, if ligatures are obliged to be fixed upon that part, they are frequently apt to gall and fret the skin very much, and cause disagreeable contusions and ecchymoses. If the arm is to be used by way of lever, the longer that lever, the greater will be it's power, and if the upper end of the os humeri is to be turned anteriorly or posteriorly during the time of extension, it will be done with greater facility when the arm is stretched out at full length, than when it is in a state of flexion. The two following cases that happened while these sheets were at the press will perhaps help to elucidate what I have just advanced.

A GENTLEMAN



A GENTLEMAN in years, very fat and bulky, had dislocated his shoulder four days before I saw him, and the head of the bone lay in the axilla. The method I took to reduce it was as follows: My patient being seated on the floor, I placed a large wooden cylinder well covered with several folds of napkins under his arms, and applied it in such a manner as not only to support his body against the extension, but also to with-hold the inferior part of the scapula. This cylinder was held firm by four assistants, two at each end. Then standing before him, I put his arm through a napkin with the ends tied together, and between my thighs; and putting the napkin over my neck and under his arm a little below the neck of the humerus, and not in the axilla as is generally practised, I directed three men standing behind me to take hold of his wrist and fore-arm with their hands, and to make an extension, beginning gently and increasing the force gradually, his arm being placed something higher than at a right angle with

his body. As soon as I thought the extension sufficient, I pressed down the acromion and coracoid processes with my hands, I raised the os humeri with my neck, and at the same instant of time I pressed down the lower part of his arm by gently sitting upon it, when it immediately slipped into the socket upon the first attempt. Thus the arm was made use of as a lever, of which my neck, by aid of the napkin, was the fulcrum. It is to be observed that three of the motions were made by myself; and it is always of much consequence that motions which are to correspond exactly in point of time should be performed by the operator himself, more especially when that time is to be regulated by other motions, viz. extension and counter-extension.

THE other case was of a strong muscular man, rather advanced in years likewise, who had dislocated his shoulder upwards of three weeks before I saw him. The head of the bone lay in the axilla, and many attempts had been made in vain by

by two different surgeons. I first suspended him by the wrist; I then repeated that operation with the arm bent, and the ligatures above the elbow, which I must observe occasioned him to make greater complaints than the other method. The heel in the armpit was next tried, but, like the rest, unsuccessfully. I then made use of the method practised in the former case, and reduced it with ease. This is the method that I have generally used with success, only with this variation, that in recent dislocations, where the reduction is not likely to be difficult, I do not use the arm as a lever, and therefore do not stand before the patient with his arm betwixt my thighs, but either on one side, or behind, pressing down the acromion with my hands while I raise the upper part of the humerus with my neck. In this, which I call the common method, the counter-extension is, in my opinion, very seldom, if ever, properly or sufficiently made. The hands alone are insufficient. Cloths, or straps, and bandages of girth-web screwed to a door-case, retain the

body indeed, but have very little effect upon the scapula. The rolling-pin is trifling. The coul-staff described by Wiseman must be very painful to the patient, as the staff must have a bunch in the middle, somewhat wedge-like, and covered with a soft bolster, fit to place under the arm-pit. The cylinder of wood which I recommend, and which my father informs me he has used upwards of fifty years, and always found the most commodious of all others, should be at least four inches in diameter, and four feet in length, with it's surface perfectly smooth. The best for this purpose are to be met with in the calender houses. When the counter-extension is made in this manner by four assistants, two at each end of the cylinder, the middle of which should be well covered with napkins, the patient will be kept perfectly steady, he will find no inconveniences from it, either at the time, or afterwards; and, what is of the greatest consequence, it so certainly keeps back the lower part of the scapula that no accident can alter it's situation. It must  
be



be remembered, that the patient must sit on the floor, and the assistants employed in the extension and counter-extension must all stand so as to be above him. If there should be any danger of pulling the patient from his seat, he will easily be kept down by the surgeon's pressing upon the acromion with both his hands.



*An Account of a complete Luxation of the Thigh-Bone, in an adult Person, by external Violence. Communicated to the Royal Society, and inserted in their Transactions, Vol. li. part 2.*

AS Robert Hogg, a farmer, in Clyfton, about four miles from Manchester, a strong, robust, middle-aged man, was taking a load of wheat from off a horse, on March 20, 1759, his foot slipping, he fell backwards, his breech upon the pavement, and the load of wheat upon his belly and thighs. The servants carried him into the house, and laid him upon a bed, where he remained in the most racking torture when I came to him, which was about two hours after the accident happened. I found his right buttock as large again as the other, the knee and foot of the same side turned inwards, and the thigh much shortened. Upon endeavouring to make the thigh perform it's rotatory

tory motion, there was not the least crackling to be heard. This convinced me that the head of the bone was thrown out of the acetabulum; and, upon examination, I could distinctly feel it under the glutei muscles: to which situation of it, and not to any bruise, I was now satisfied that the size of the buttock was owing.

I soon reduced it by the following easy and very simple method:

SOME napkins being first lapped round one of the posts at the foot of the bed, to prevent it's galling him, I ordered the patient to be laid on his back, with one leg on each side of the post, and directed three or four assistants to pull at the dislocated limb, the post now placed to his groin, being a fixed point to pull against. Whilst they were making this extension I clapped my left hand upon the head of the bone, to help it into it's place, and,  
at



at the same instant, with my right hand turning the knee outwards, threw the bone into the socket with the greatest facility imaginable, but with such an uncommonly loud noise, as greatly astonished all who were present. He was perfectly easy from that moment, the enlargement of the buttock intirely subsided. In a fortnight he was able to move about without assistance; and, in two months afterwards, walked as far as Manchester, being then quite sound, and the limb which had been dislocated of the same length with the other.

#### R E M A R K S.

BOTH ancients and moderns have fallen into great errors, in regard to the treatment of accidents that have happened to the hip joint. The ancients, who, for want of frequent opportunities of dissecting bodies, were ignorant that the neck of the femur was often broken, always ima-  
gined

gined it to be luxated. Their patients were therefore sometimes tormented, in hopes of a reduction, without any advantage: and this want of success made the surgeons at other times abandon their patients when they might have been relieved. The moderns have fallen into a contrary extreme, but attended with as bad consequences. Boerhaave in particular was of opinion, that there never was a dislocation of the thigh-bone in an adult person by any external violence, but that the head of it was intirely broken off at it's neck, near the great trochanter. The opinion of so learned a man has had such weight with the generality of the profession, that it has been taken for granted, that in these cases the neck of the bone was always broken, consequently the reduction was seldom attempted, and the unfortunate patients remained cripples during the rest of their lives. But the point is now, I think, cleared up, beyond the possibility of a doubt.

IN the second volume of the Memoirs of the Royal Academy of Surgery at Paris there are two cases related, to shew the resources of nature where luxations of the thigh-bone have not been reduced. Here it appears, from examinations after death, that in the first case the bone was thrown out upwards and outwards, the cotyloid cavity greatly diminished in size, and it's figure changed from round to oval. The head of the femur was received into another cavity formed upon the os ilium, under the gluxæus minimus, which served it as a capsula, to secure it within this preternatural cavity. The accident was occasioned by a fall, when the patient was a child. She was afterwards able to walk about, though she continued a cripple to the time of her death, which happened at the age of sixty-eight. In the other case the bone was luxated downwards, and inwards, and the head fixed upon the foramen ovale.

THERE

THERE is a case too related, and very well attested, in the Edinburgh Essays, philosophical and literary, vol. ii, of a man at Worcester, who had the head of the bone thrown out of the acetabulum, and lodged in the groin. It was with some difficulty reduced, and the man suffered no other inconvenience than that of the dislocated leg's being almost a quarter of an inch longer than the other.

To these let me add, that about thirty years ago my father was sent for to a man, who had luxated his thigh-bone three or four days before. The head of it lay in the groin, which the surgeon who was first employed did not discover: however it was immediately replaced, and the patient recovered the use of his limb in a very short time.

FROM what I have said I would by no means have it concluded, that the neck of the bone is not sometimes broken, or that



that it is not even oftener broken than luxated: but from the case which has directly fallen under my notice, joined to those which I have above recited, I think it must appear very clear that it has been frequently luxated, and that likewise different ways.

K

*A remarkable*



*A remarkable Dislocation of the Eye.*

C. D. applied to me about ten or twelve years ago, upon account of the following remarkable accident which had just happened. As he sat in company a person thrust the small end of a tobacco-pipe through the middle of his lower eyelid. It had passed between the globe of the eye and the inferior and external circumference of the orbit, which is composed of the os mali, and was forced through that portion of the os maxillare, which constitutes the lower and internal part of the orbit. The pipe was broken in the wound, and the part broken off, which from the examination of the remainder appeared to be about three inches, was quite out of sight, or feeling; nor could the patient give any account of what was become of it. The eye was dislocated upwards, pressing the upper eye-lid against the superior part of the orbit; the pupil pointed upwards perpendicularly, the musculus deprimens was upon the full stretch, and the sight of the eye was intirely taken from him.

K 2

I applied

I applied one thumb above and the other below the eye, and, after a few attempts to reduce it, the eye suddenly slipped into it's socket. The man instantly recovered his perfect sight, and felt no other inconvenience than that of a constant smell of tobacco smoke in his nose for a long time after ; for, as he informed me, the pipe had just been smoked in before the accident. About two years afterwards he called upon me to acquaint me, that he had that morning, in a fit of coughing, thrown out of his throat a piece of tobacco-pipe, measuring two inches, which was discharged with such violence as to be thrown seven yards from the place where he stood. In about six weeks he threw out another piece, measuring an inch, in the same manner, and has never since felt the least inconvenience.

R E M A R K.

PERHAPS the term *dislocation*, for which indeed, in this case, I have no precedent, may be objected to. I believe we have here



here an accident that was never described by any author, but the eye was certainly as much dislocated as ever a joint was; and the etymology of the word will undoubtedly bear the application I have given it. I am not at all amazed that the tunica conjunctiva and the muscles should bear to be stretched, without suffering any injury; but it is rather surprising that the optic nerve, after being so suddenly elongated, should in no respect suffer, and that the man should recover the perfect sight of his eye immediately after its reduction. It was luckily indeed not above half an hour in this unfortunate situation; had it been longer, in all probability, the event would not have been so happy for my patient.



*An extraordinary Tumour on the lower Part of the Orbit of the Eye, thrusting the Eye out of it's Socket, successfully extirpated by Dr. Thomas White.*

**A**NN SUTTON was afflicted with a tumour betwixt the zygomatic process and the nose, arising from the lower part of the orbit of the left eye. In two years time it put on a frightful appearance, having grown to such a bulk that it pressed the nostrils to one side, so as to stop the passage of the air through them, and thrust the eye out of it's orbit, so that it lay on the left temple, yet, though thus distorted, it still performed it's office. It occupied the greatest part of the left side of the face, extending from the lower part of the upper jaw, to the top of the forehead, and from the farthest part of the left temple to the external canthus of the eye. She at length applied to me for relief. Upon handling the tumour I found an unusual and unequal boney hardness. It was of a dusky livid colour, with varicous veins on the surface, and there was a soft tu-

K 4

bercle

bercle projecting near the nose, where nature had endeavoured in vain to relieve herself.

As the poor woman was resolved to undergo any thing for a cure, I called in four physicians to consult on the case, and it was agreed to attempt her relief by an operation. This I performed in the following manner :

I BEGAN with a semicircular incision below the dislocated eye, in order to preserve that organ, and as much as possible of the obicular muscle ; then carrying the incision round the external part of the tumour, I brought it to the bottom of it, and then ascended to the place where I began, taking care not to injure the left wing of the nose. After taking away the external part of the tumour, which was separated in the middle by an imperfect suppuration, there appeared a large quantity of a matter like rotten cheese, in part covered by a boney substance, which however was so carious as to be easily broken through. I scooped away abundance of this matter, with a  
great



great many fragments of rotten bones. Upon cleansing the wound from blood and filth with a sponge, I found the left bone of the nose, and the zygomatic process carious, and easily removed them with an elevator. There were no remains of the bones composing the orbit of the eye, which were plainly destroyed by the same disease. The optic nerve was denuded as far as the dura mater; and the dura mater and pulsation of the vessels of the brain were apparent to the eye and touch. The left superior maxillary bone, in the sinus of which this disease had it's origin, and remained a long time concealed, was surprisngly distended, and in some places become carious; it had exfoliated from the lower part to the sockets of the teeth, which part was in like manner removed.

I APPLIED the actual cautery to the rest of the bones and putrified parts, taking care not to injure the eye, and neighbouring parts, which were sound. The patient drew her breath through the wound, and was so incommoded by the foetid matter  
flowing

flowing into her throat, that she was obliged for several weeks to lie on her face, to prevent suffocation.

NOTWITHSTANDING her miserable condition, nature at length assisted, a laudable pus appeared, sound flesh was generated, and the patient recovered. The eye returned to it's place, and she enjoyed the perfect sight of it. The only inconvenience that remained was a constant discharge of mucus from the greater canthus of the eye, which I could never thoroughly cicatrize.

*Dissection of an Arm on which the Operation  
for the Aneurism had been performed.*

**A**BOUT two years ago a woman died in the Lunatic Hospital in Manchester, who, about fourteen years before, had undergone the operation for an aneurism, occasioned by bleeding in the right arm, which perfectly succeeded. As opportunities of examining the state of the parts after death seldom occur, I was determined not to miss that which now offered. I accordingly injected the axillary artery with wax, and then took the arm off at the joint, and dissected it. The annexed figure is a true representation of it's appearance.

As I do not recollect to have seen or heard of a \* preparation of this sort, I imagine it will not be unacceptable to the public. We may here not only admire the wonderful power of nature in continuing the cir-

\* MOLINELLIUS, in the Act Benon. vol. i. part 2, page 72, has given us the history and a drawing of an aneurism similar to this, which he dissected, but it does not appear that the arteries were injected, or the parts preserved. I am oblig'd to Dr. Hunter for this note, as I am not in possession of the book.

culatation, when almost three inches of the principal artery were obliterated, but surgeons may be encouraged never to despair of success in a similar operation : for in this case the humeral artery was tied above it's division into the radial, ulnar, and interofocal arteries : and the small capillary arteries appear to have undergone so great a dilatation, as when taken together, to exceed in diameter the trunk of the humeral artery, which, by their \* tortuous anastomoses, they fill again beneath the obliteration.

MY worthy friend Dr. Hunter has done me the honour to give this preparation a place amongst his valuable collections.

## P L A T E VII.

A FORE view and a side view of the preparation. The dotted lines at A express the extent of the obliteration of the trunk of the artery.

\* FOR a curious investigation of these tortuous convolutions. see Dr. Hunter's observations on aneurisms in the Medical Observations and Inquiries, vol. ii. p. 411, and Molinellius in the Act. Benon.

*An*



Pl. VII.

*Fig. 1.*



*Fig. 2.*





*An Aneurism of the Leg occasioned by a Fracture, in which the Sponge was successfully used.*

**A** BRAHAM COOK, of Staley-bridge, in Cheshire, a healthy man, betwixt thirty and forty years of age, on December 25, 1764, had the misfortune to break both bones of his leg. The fracture appeared only simple, and went on very well till about six weeks after the accident, when a tumour began to rise on the forepart of the leg, betwixt the tibia and fibula, which in a little time burst, and poured forth a great quantity of blood. This was the account given by the patient, and the surgeon, who was employed when I was sent for to take off the leg. Upon examination I was convinced that there was an aneurism of the arteria tibialis antica. I immediately laid open the whole tumour, which was full of coagulated blood; and after cleaning it away, loosened the tourniquet, which had been previously applied, and perceived the orifice  
in

in the vessel which lay very deep betwixt the two bones. Upon introducing my finger I also discovered the cause, which was a splinter of a bone above an inch long, as small and sharp pointed as a needle; this I easily broke off with my finger, and brought out. The difficulty was now how to secure this vessel. It was impossible to use a needle, as there was no room to turn it, it was as impossible to draw out the artery with any instrument on account of its depth, and it was too large to be trusted to the actual cautery, or to any kind of styptic. That ingenious surgeon Mr. Gooch, in a note to his cases and practical remarks \*, p. 136, edit. 1, says, “ among  
 “ the rest of our chirurgical conversation  
 “ at this meeting, mention was made of  
 “ an accident, in which one of the arteries  
 “ between the tibia and fibula was opened  
 “ about the middle of the leg, and the bleed-  
 “ ing stopped from time to time, by various  
 “ methods, but at last it was thought ad-  
 “ viseable to amputate the limb.

\* SEE likewise Gooch's practical treatise on wounds,  
 p. 124.

“ Upon



“ UPON reflection it occurred to me,  
 “ that in this case the removal of two or  
 “ three inches of the fibula was practica-  
 “ ble, and that it probably might have given  
 “ a fair opportunity of coming at the  
 “ bleeding vessel, and proved the means of  
 “ preserving the limb.”

THIS thought was truly ingenious, and very probably would have answered: it was certainly worth the trial before that last of resources, amputation, was put in practice; but from my experience of the sponge, I had not the least doubt but that both these operations, in the present case, would be unnecessary. Accordingly I applied a piece of dried sponge to the orifice of the vessel, cut in the manner I have described in my treatise on the use of the sponge; and over that some compresses, and a bandage to secure it firmly in it's situation. The hæmorrhage immediately stopped, but in a few days I was sent for again upon a fresh eruption. On examination I found there were more orifices than one, and that this latter hæmorrhage

was from another totally different from that to which I had applied the sponge. As this was the case, I cut the artery through with a small knife, as high as the uppermost orifice, and then applied a piece of dried sponge large enough to fill the whole space betwixt the bones, when the bleeding instantly ceased, and never gave us farther trouble.

THE blood which had insinuated itself between the muscles, tendons, and bones, for a large extent, before the tumour was opened, now gave us some disturbance, by occasioning several formations of matter, but all difficulties were in a little time overcome, and the man retains the perfect use of his leg.

*An Hæmorrhage, from a Wound of the Radial Artery, stopped by the Sponge.*

**D**ANIEL BERTLES, of Alderley, in Cheshire, a middle aged man, had the misfortune, on October 2, 1762, to cut the radial artery with an ax a little above the wrist. *Agaric, bovista*, and many other things, were applied by different persons, and the artery was twice taken up with the needle and ligature, by Mr. Allen, a surgeon of reputation at Knutsford, well accustomed to the operation. He however did not see the patient till the fifth day after the accident. After each of these methods the hæmorrhage stopped for a few hours, and then frequently burst out again, especially upon the accession of a hot fit, to which he was now very liable. On the seventh day I was called, in consultation with Mr. Allen, to take off the arm. We found his hand and arm swelled to three times it's natural size, from the frequent

L

use

use of the tourniquet, which had been under a necessity of being moved to different parts of the arm on account of the excoriations it had occasioned. For the last twenty-four hours it had been applied almost without intermission from a dread of his bleeding to death, as he had lost a prodigious quantity of blood. After the dressings and clotted blood were removed, we could distinctly see the mouth of the vessel throwing, *per saltus*, what I can scarcely call blood, as it's colour could hardly be distinguished upon linen. I applied a piece of sponge, in the form of a cone, with it's apex towards the mouth of the vessel, over that another piece somewhat larger, and upon these the usual dressings secured by a bandage put on extremely slack, on account of the swelling; as he lived many miles from a surgeon we durst not leave him without some little security, and therefore fixed Petit's tourniquet upon the bandage over the sponge, upon which it made a small pressure; and left directions for it to be screwed tighter or slacker, as his attendants should



should find necessary. As the arm was so much swelled Petit's tourniquet was certainly preferable to a tight circular bandage, because it only presses in two points, and therefore the pressure might be increased without interrupting the circulation. The tourniquet at the upper part of the arm was left quite loose. The patient rested very well till about four o'clock the next morning; when a violent heat and burning came on, with a great pulsation, about the wound, which continued near an hour. Mr. Allen found him asleep at eight that morning, and quite slackened the screw without his perceiving it. He left directions only to tighten it occasionally, when he moved about. I saw him on the fourth day after the application of the sponge, and, though every thing remained quite slack about the wound, not a drop of blood had been discharged. I now left him to the care of Mr. Allen, who removed the sponge in a few days, and he was soon well, without any other inconvenience than that of it's being some

time before his strength was perfectly recovered \*.

\* The danger and trouble sometimes attending wounds of the radial artery, at or near the wrist, may be seen by two cases related by O'Halloran on the gangrene and sphacelus, Obs. 47 and 48, and by Gooch, in his practical treatise on wounds, p. 124, and 170, when loss of limb, and even of life itself, has been the consequence.

*An Hæmorrhage, from an Artery of the  
Eye, stopped by the Sponge.*

A YOUNG lady consulted me, about the end of September 1762, concerning a *hydrophthalmia* with which she had been troubled from her birth, or so soon after, that her friends could not be certain about it. It occasioned a great pain in her head, and the other eye was so much affected by it that she was afraid of losing it likewise. It had been opened by a surgeon, and intirely subsided, but soon filled again. I therefore advised cutting the cornea intirely out, by a circular incision. I began by opening it with a knife, and when the eye was become flaccid, by letting out the water, I then took hold of the cornea with a hook, and, with one stroke of the scissars, cut out the whole. An artery that was preternaturally enlarged bled very freely, much more so than I expected. I waited as long as I thought was prudent, to see if it would stop of itself, but as it did not, after I had wiped the eye very clean, I introduced

a piece of dry sponge, and over that the common dressings, secured by a handkerchief. The hæmorrhage was immediately suppressed; I removed the sponge in four or five days; a firm cicatrix formed in about three weeks, and her complaints returned no more upon her. I cannot help remarking, that in this case the sponge seemed peculiarly serviceable; for as the humours were discharged, and the remainder of the eye sunk in the socket, it would not have been easy to use the needle and ligature. Styptics would have been very painful, and might perhaps have brought on bad consequences; and as the young lady was of a delicate habit, and her eye exquisitely sensible, strong compression might have been attended with inconveniences.



*An Account of the successful Use of the Sponge, in the Stoppage of an Hæmorrhage, occasioned by Amputation below the Knee; and of the remarkable Effects of that Application in preventing the Absorption of Matter.*

WILLIAM SMITH, of Buxton, in Derbyshire, aged twenty, was admitted into the Manchester Infirmary for ulcers of the ankle, which were attended with a caries. The absorption of matter had brought on a cough, colliquative sweats, a diarrhœa, and an hectic fever, which consumed him very fast. His hot fits were extremely violent: they usually continued more than two hours, and returned upon him daily. When he was most free from his fever, and consequently coolest, his pulse, which was most carefully observed by a pulse-watch, beat one hundred and fifty four times in a minute. Many medicines, which proved no more than palliatives, were made use of. Amputation was therefore resolved upon, and

I performed the operation in the usual place below the knee, on March 20, 1762. Upon slackening the tourniquet, the arteries bled freely. After I had again tightened that instrument, and wiped the wound with a sponge pressed out of warm water, in order to cleanse it from grumous blood, I covered the whole stump with pieces of dried sponge, applied over these the common dressings, and retained them on by no tighter a bandage than what was just necessary to keep the sponge in contact with the mouths of the divided arteries. The tourniquet was let loose in about fifteen minutes after the operation. I now recollected that I had omitted to cut the interosseous ligament, but as the stump was dressed, and the patient in bed, I was for the present unwilling to disturb him. In about an hour his hot fit came on, and an eruption of blood soon after succeeded, but it was immediately suppressed upon the application of the tourniquet, by a person whom I had left in the room. I returned soon after, and, removing the dressings, discovered, as I expected, that the effusion

of blood proceeded from the tibialis antica. I therefore with a knife divided the interosseous ligament about half an inch, for the reasons given in my pamphlet on *The topical application of the sponge, in the stoppage of hæmorrhages*, and re-applying the sponge, in about a minute afterwards I slackened the tourniquet. It appeared however that the sponge had not time enough to secure it's situation. For this reason it was necessary again to tighten the tourniquet. The sponges, which were saturated with blood, were removed, and I applied fresh pieces to the extremities of the vessels, pressing that which I had placed upon the tibialis antica tightly down between the separated edges of the interosseous ligament. A second piece was applied over this, and a whole undried sponge was placed to cover both, these were all of them retained by four cross slips of good sticking plaster, and, to render them still more secure, I took a double headed bandage, bended the knee, and, bringing the middle of it to the extremity of the stump, passed each end several times

over

over the knee, and back again, making the compression something tighter than usual. I did not however turn it round any part of the limb, circular bandages, when applied too tight, being frequently prejudicial. In less than half an hour the tourniquet was intirely slackened, and I had no further occasion to repeat it's use, not the least effusion of blood succeeding. The great heats under which my patient laboured, the thinness of his blood, and excessive quickness of his pulse, made me think all the precautions I had taken necessary. As I was convinced the sponges must have sufficiently secured themselves, I removed the tight bandage early the next morning, and the sponges were taken away a fortnight after amputation, not the least difficulty nor any effusion of blood attending their removal. For some time his hectical complaints appeared to be less troublesome, but they grew worse again, and I attributed their return to the absorption of matter. To remedy this the *decoct. sarsap.* was ordered, and I dressed the stump every day with sponge, after the manner described

by



by Mr. Kirkland, in Vol. ii. of Medical Observations and Inquiries. In a few days his diarrhœa abated, his heats began to decrease, and he was visibly better, but as it was yet doubtful whether I was to attribute this change to the *sarsaparilla* or the sponge, I intirely discontinued the use of the latter. In two days time he again began to alter for the worse, and in less than a week was as bad as ever. I repeated the sponge, all his bad symptoms, and particularly his looseness, which had resisted the power of many medicines, after a few days began to abate, he gradually continued to mend, and the sponge was applied as long as it had any wound to cover. He was discharged cured upon May 31, and on September 27, when I had last an opportunity of seeing him, he remained in a tolerable state of health.

I CANNOT help attributing the preservation of this person's life to Mr. Kirkland's method of preventing the absorption of matter ; and as far as a single case can be proof of any general doctrine, it has con-

vinced me of the utility of his manner of application. I believe I have several times seen it's advantages, and as I am sensible of the difficulty which often occurs in ascertaining facts, I shall always be extremely cautious of building any theory upon the credit of uncertain trials; however, as this application appears to me to be both safe and easy, and at the same time seems to be a reasonable practice, I cannot help recommending it as well worthy the attention of the faculty.

AFTER frequent repetitions of the stoppage of blood by the sponge, it was impossible for me not to observe that wounds were clearer and fresher \* in those places  
upon

\* When I mentioned this circumstance to a surgeon of eminence in London, he asked me whether it was not owing to the first dressings having lain longer when the sponge had been applied, than upon any other part; for that in the hospital he had not of late years taken off the first dressings from a stump till the eighth day after the amputation, and found the stumps much clearer and better digested than when the dressings were sooner removed. I agree with this  
gentleman

upon which the sponge had been applied than in any other. This tempted me to make trial of it upon foul ulcers, and in abscesses recently opened, and it has fully answered my expectation, clearing them with greater ease, more expedition, and much more effectually than any other method I have yet seen introduced into practice. Most foulnesses are, if I am not deceived, to be attributed to sharp acrid matter, which lodges itself within the cavities of the abscesses, and upon the surfaces of ulcers. Dry sponge applied without lint, by it's gentle adhesion, carries along with it whatever is easily removed, and the repetition of it takes away the

gentleman that he is right in continuing the dressings no matter how long, provided they do not grow offensive; but I can by no means allow, as I have since my conversation with him been more than usually attentive to this particular, that the effect attributed to the sponge, is caused by the continuance of the dressings only; for if sponge be laid upon one part of the wound, and dry lint upon another, and both the applications removed together, that part of the wound upon which the sponge hath lain will be considerably fresher than the other.

cause.

cause. If the sponge be made use of to clear foul ulcers, it must be perfectly dry, and applied without any lint; but if it be only used to prevent absorption Mr. Kirkland's manner will need no kind of alteration. I must beg leave to mention another advantage from the sponge, which that gentleman has omitted. It prevents the luxuriance of those fleshy granulations which can sometimes be no otherwise prevented than by bandages or caustics. These it keeps down, partly by a removal of that matter in which they would otherwise be constantly soaked, and partly by a compression the most easy and equal that can possibly be imagined, from the natural elasticity of the sponge.



*An Account of an Hæmorrhage, from an Artery in one of the Tonsils stopped by Ligature.*

A GENTLEMAN of about forty years of age, having had a violent inflammation of his tonsils, one of them gathered and burst, and the discharge of matter was succeeded by a considerable quantity of blood, which he threw out of his mouth, but from whence it proceeded both he, and the persons who were with him, were at a loss to determine. I inspected his throat, and discovered that it came from an artery situated upon the tonsil, which the matter had corroded.

I ORDERED astringent gargles, and applied the most powerful styptics. The effects of these remedies were of short duration. I tried the actual cautery, and repeated it several times with no better success. Loss of blood had rendered my patient so weak that his friends, as well as myself were very much alarmed. I there-  
fore

fore attempted the securing the vessel by ligature.

To effect this I passed the needle\* usually employed in the extirpation of indurated tonsils, armed with a double thread, through the edge of the tonsil close to the bleeding artery, then, by the help of an hook, laying hold of that part of the thread which had been passed through the tonsil, I brought it out of the mouth, and withdrew the needle. I now, by the assistance of the *tonsil instrument* †, held one end of the thread upon the side of the tonsil next to the throat, and making the knot by pulling at the other, included the bleeding vessel in it. By these means it was perfectly secured, and gave us no further trouble.

\* THIS needle is fixed in a wooden handle, and has an eye at it's point.

† THIS instrument has a small ring at the end for the thread to pass through, and was contrived by the late Mr. Cheselden.

I do not know whether I have explained myself sufficiently to persons not conversant in matters of this nature, but I believe I shall be well enough understood by those who are acquainted with the method of extirpating by ligature such schirrous tonsils as are of a conical form; the same instruments, and nearly the same means, here made use of, being employed for that purpose.

#### R E M A R K.

IN all spittings of blood we cannot be too inquisitive in regard to the part from whence the blood proceeds. I have frequently known patients, and sometimes those of the faculty, mistake hæmorrhages from the mouth, throat, and back part of the nostrils, for a true hæmoptoe, which hæmorrhages may be generally remedied by topical applications. In the present case, if the ligature had failed, an instrument might have been contrived which would have made a constant pressure upon the  
M part,

part, and would in all probability have stopped the bleeding artery.

I ONCE met with a very considerable hæmorrhage, after an amputation of the penis of a poor man in the Infirmary, which resisted many applications. I perceived that the blood flowed not from any particular vessel, but from the whole substance of the corpora cavernosa, and from the spongy part of the urethra, therefore having first introduced a canula into the urethra, and stripped back the skin, I passed a needle, armed with a double thread, through the corpora cavernosa, and, dividing the threads, tied one part above and the other below, by that means included the corpora cavernosa and the urethra in the ligatures, which perfectly answered the end. I let the ligatures remain about twenty-four hours, when I cut them without any hæmorrhage, or any other inconvenience ensuing, and my patient soon recovered.

I HAVE been informed that some little while ago a person, at Newcastle upon Tyne;



Tyne, had the misfortune to have the humeral artery wounded by a lancet in bleeding. Mr. Leighton, and afterwards Mr. Lambert, two surgeons of eminence in that town were consulted. They agreed that the operation for the aneurism was necessary, which was performed, and the artery secured by the pin, and twisted future, according to the method described by Mr. Lambert in vol. ii. of the Medical Observations and Inquiries, but in a few days a violent hæmorrhage ensued. Upon the failure of this method ligatures were tied round the trunk of the vessel, both above and below the orifice, in the usual way, which restrained the bleeding for some time, but it afterwards burst out again with great violence. Sponge was now applied to the bleeding artery, which being assisted by compression, effectually stopped the hæmorrhage, and never afterwards returned. I do not find that any difficulties occurred after the application of the sponge except in the removal of it, when some small particles remained behind, which were however

perfectly healed over without any inconvenience.

For further particulars of this case I must refer the readers to the next volume of Medical Observations and Inquiries, in which I hope the public will be favoured with it, as Mr. Leighton informs me he has promised it to Dr. Hunter for that publication.

I HAVE only to observe that in the use of the sponge I never found that compression was necessary longer than five hours after it's application ; but if for the greater security it should be thought expedient to continue it for the first night, that will certainly be long enough ; and if the directions I have given be attended to, in the choice of the sponge, in the manner of cutting it before, and removing it after it's application, I believe no difficulties will arise worth notice, in regard to the removal of it, especially if it is not permitted to remain on too long ; at least I can assure the public that I have not met with any  
 3 ever

ever since I published an account \* of the manner of applying it, though I have used it since that time to great numbers of patients. I do not mean to say that it can, in many cases, be removed absolutely without pain, I know that we cannot remove lint, or even touch a fresh wound, without giving pain in some degree.

\* VIDE an account of the topical application of the sponge.





## C O N C L U S I O N.

**I** MADE use of the sponge for the stoppage of hæmorrhages in all cases indiscriminately for near three years, in which time there were nineteen amputations of the larger extremities, six of which were of the thigh, and most of the principal operations of surgery, as lithotomy, castration\*, bubonecele, the trepan, schirrous and

\* AFTER the division of the spermatic arteries I have generally found the method which Mr. Warner recommends sufficient. He says, in his cases in surgery, p. 255, " The only method I have of late years made  
 " use of for staunching the blood, after the extirpa-  
 " tion of the testicle, is by making a gentle com-  
 " pression of the vessels, for a few minutes, betwixt  
 " my thumb and fore finger; afterwards the applica-  
 " tion of a bit of lint to the mouths of the vessels has  
 " effectually answered the intention, without giving  
 " the least degree of pain, which should be avoided  
 " as much as possible in this and every other operation  
 " in surgery, when it can be done with safety."

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cancerated † breasts, and encysted tumours, besides many accidental wounds, and violent hæmorrhages from the extraction of teeth, where it was peculiarly serviceable, and after the application of leeches. In all these trials it never failed me, except in one instance, which was after amputating the thigh of a young gentleman, who had a white swelling in the knee, attended with constant convulsive twitches in his leg and thigh so great as to raise the limb every five minutes from the pillow. These twitches continued after the operation, and would never allow the sponge to adhere. After some ineffectual trials of it, I secured the femoral artery with the needle and ligature, and the patient went on very well for three weeks, so as to be able to sit up many hours in a day, to read and write, and play on the flute, but about the expiration of that time he was seized with

† IN hæmorrhages proceeding from those ulcerated tumours, called bleeding cancers, the fungus vinosus, which is to be met with on old casks in Wine Vaults, is the best application I know of.

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the symptoms of a locked jaw, and died in a few days.

NOTWITHSTANDING all these cases in it's favour, there is one inconvenience attending it's use in very large arteries, which is it's uncertainty for a few hours after it's application, so that I never durst trust it without it's being narrowly watched for some time; but after four or five hours were expired, I always thought it perfectly secure, even more so than the needle and ligature.

UPON hearing of \* Mr. Bromfeild's success in drawing out arteries with the tenaculum, and including the vessel alone in the ligature, I was induced to try this practice. In the large arteries which are surrounded with a good deal of cellular substance, the vessel may easily be drawn

\* I MUST take this opportunity of acknowledging my obligations to Mr. Bromfeild, for communicating to me, by letter, this method of securing the blood vessels.

out

out alone ; and here too much cannot be said in favour of this method, which is totally free from pain, and from the inconvenience attending every other mode of practice. But the small arteries situated amongst the muscles can seldom or ever be drawn out without some of the fibres of the muscles with them, the tying of which must necessarily be attended with pain. Yet here I even think it preferable to the needle ; however, if I may be allowed to judge impartially, the sponge deserves the preference over every other method, wherever the smaller arteries are divided, in such cases where the larger arteries cannot be taken up by the tenaculum or needle, or where the flesh is become so tender as to give way to the ligature.

IT may be thought that I conclude the needle of no use, but I should be sorry to be debarred the practice of it, as occasions may offer where it may be serviceable, and it is always right to be provided with more remedies than one.

IN



IN regard to the means which nature employs in the stoppage of hæmorrhages, from divided arteries, I never thought Petit's theory of coagulum at all probable. A coagulum of blood formed at the end of an artery is so far from being of any service, except in some few cases where the air cannot get admision, that it is absolutely prejudicial, as I have often observed, and should always be removed before the application of sponge, or any fungous substance.

POUTEAU's hypothesis, that the swelling of the surrounding cellular substance closes the artery, seemed more probable; but I am now convinced, from several observations, that, according to the supposition of Mr. Gooch, since confirmed by my ingenious friend Mr. Kirkland, the arteries, by their natural contraction, coalesce as far as their first ramification. The following cases are good proofs of this doctrine.

AN

AN old woman had a compound fracture of the fore-arm, by which the tendons were lacerated, and the joint at the wrist much shattered. In three weeks after the accident she was seized with great pain, and with convulsions and spasms in her right leg, from whence I judged it proper to amputate in the middle of the fore-arm without further delay. The arteries were stopped with sponge. The spasm in the leg however continued, and was followed by others all over her, and she died convulsed on the twenty-ninth day after the accident, and the eighth from the operation. I was desirous of seeing in what state the arteries were after the use of the sponge, and for this purpose laying bare the humeral artery, I cut it open to the place where it divides into the radial and ulnar branches. I then introduced a common silver probe into each branch, which passed very easily to a certain point, which seemed about an inch from the extremity of the stump, but could go no further. I then used bristles, and pushed them with all the force they would bear, but they

stopped

stopped at the same place. I next laid open the arteries to their extremities, and found them intirely closed, near an inch from the end of the stump ; but from that point upwards their capacities were not at all diminished, nor was there any coagulum or clot of blood in the vessels, or any where near them.

IN the arm I have by me, on which the operation for an aneurism had been performed, (see Page 139, Plate VII.) it is plain to a demonstration, by the injection, that the artery was closed both above and below the ligature to the next lateral branch : and it is not likely that the surgeon who performed the operation should have made his ligatures at so great a distance from each other as three inches.





A N

E S S A Y

O N T H E

LIGATURE of ARTERIES.

B Y

J. A I K I N, Surgeon.



T O

Mr. Charles White, F. R. S.

DEAR SIR,

THE following little essay having been favoured with your approbation, I take the liberty of putting it under your protection; that, being ushered into the world along with your very valuable publications, it may meet with that notice which the obscurity of a young author would not otherwise entitle it to.

I SHALL ever esteem it a most fortunate circumstance of my life, that I received my education under a gentleman who has the improvement of his profession so much at heart. If I have imbibed any of this spirit, to you

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I am greatly indebted for it. I therefore beg leave to inscribe to you this first fruit of my studies, as a small testimony of gratitude and esteem; and to assure you that I am, with great sincerity and friendship,

Dear S I R,

Your obliged humble servant,

MANCHESTER,  
1769.


JOHN AIKIN.





ON THE

## LIGATURE of ARTERIES.

T may perhaps seem a needless task to attempt any farther discussion of a subject which has exercised the talents of men of the greatest eminence in our profession. And, indeed, if what I had to offer were only a matter of theory, or barren speculation, I should stand greatly in need of an apology for obtruding my sentiments on the public, in opposition to those of persons, whose knowledge and acuteness of genius are much superior to what I can pretend to. But an improvement in a point of practice does not require such an apology. It's importance to mankind fully justifies an attempt to make it general: and a man of very mo-

derate abilities may be serviceable to the world, by relating what has been the object of his experience and observation.

It is merely this merit of information that I aim at in the present essay. The practice recommended in it is ancient, and has been revived by several surgeons in their own practice: but none that I know of have publicly shewn it's advantages. It is my design to set these in a clear light, by arguments drawn both from theory and experience; and I hope for that countenance from the public, which my intentions deserve.

I SHALL begin with a few physiological observations upon arteries, taking the illustrious Haller for my guide.

AN artery is a firm elastic tube, void of sensibility, and without manifest irritability.

As muscular fibres however may evidently be traced in the larger arteries, which in other parts of the body are universally  
known

known to be irritable, it seems unreasonable intirely to deny irritability to arteries.

ARTERIES are certainly possessed of a contractile power. This may either proceed simply from the elasticity of their texture, or from the action of their muscular fibres when irritated.

ARTERIES may therefore be considered in a double view in their action of propelling the blood; either as simple elastic tubes, the natural diameter of which being dilated by the blood, thrown in from the heart, they continually tend to overcome this dilatation, and return to their natural state; or as susceptible of an irritation from the distending blood, which excites the muscular fibres to act, from whence proceeds a real vital contraction, similar to that of the heart and other hollow viscera.

THE contractile power proceeding from their elasticity is certain and demonstrable, remaining strong even after death; that

proceeding from irritation can only be inferred from analogy and circumstantial arguments.

HALLER, after bringing arguments to prove the vital contractile power of arteries, concludes with speaking very dubiously concerning it : “ His si addideris, &c. “ non erit, cur omnino vitalem etiam “ vim contractilem arteriis deneges.”

*Element. Physiolog. tom. 1, p. 72.*

LET us now consider what must follow upon the total division of an artery.

THE dilatation, or, in other words, the pulsation of arteries, is occasioned not so much by the *quantity* of blood expelled from the heart at each contraction, as by the *impetus*, which urges the blood nearer the heart to flow swifter than it does at a distance, where it is continually delayed by the friction of the numerous ramifications. By this means the blood not being able to flow off so quickly as it flows in, is obliged to dilate the arteries for more  
room



room, which, again contracting, give a fresh motion to the blood. Now when an artery is divided, the blood, no longer meeting with the obstacle of the innumerable ramifications below the division, flows off freely ; whereby the cause of the dilatation of the artery is much lessened. This allows it's contractile power to act more forcibly, and with longer continuance ; and the truncated extremity of the artery being deprived of the support of the part below it, the contraction is determined to it, as to a point. This, with perhaps the effect of the cold air in stimulating the artery to contract, and agglutinating it's orifice with coagulated blood, proves sufficient in general intirely to close a small artery, and greatly to diminish the stream of a considerable one. The contraction having once overcome the impetus of the blood, continues to act with greater and greater advantage, till, as has been found by experiment, the artery closes some distance above the truncated extremity.

WHETHER this theory be just or not, the fact is certain : that arteries close by their own natural contraction, and not by a coagulum formed in the truncated extremity. The doctrine of a coagulum has been sufficiently refuted by the experiments of Mr. Pouteau, Mr. Kirkland, and others ; and Mr. Kirkland has brought the strongest proofs that the *contraction* of arteries *alone* is the chief agent in suppressing hæmorrhages. I cannot therefore subscribe to Mr. Pouteau's opinion, who assigns this office to the tumefaction of the parts surrounding the artery. For it is to be considered that

FIRST, Arteries frequently close of themselves much sooner than any tumefaction can take place.

SECONDLY, Some thin membranous parts are not susceptible of such a tumefaction as would give an effectual lateral pressure upon the arteries, yet we do not find hæmorrhages particularly difficult to suppress in them.

THIRDLY,

THIRDLY, The success of the artificial means to suppress hæmorrhages, as perpendicular pressure, the application of fungous substances, &c. does not agree with this theory.

FROM these arguments I think we may fairly infer, that, although it may easily be conceived that the tumefaction of the surrounding parts is capable of closing an artery, yet that it is at most but an auxiliary aid, and what nature is able to dispense with, and therefore is not the object to which art ought principally to be directed.

WE have now seen what nature attempts towards the closing an artery. It's efforts in an artery of considerable size are generally ineffectual. I think myself sufficiently authorized to take for granted that ligature is the most efficacious of the artificial means to suppress an arterial hæmorrhage.

THE action of a ligature is immediately to form a strong barrier to the impetus of  
the

the blood. When this is effected, the case is much the same as in an artery closed by the efforts of nature. The contractile power continues to act above the ligature, the artery closes for some length, and, in process of time, it's sides firmly adhere to each other. Neither is this obliteration of the inferior part of the artery long in taking place. Mr. Kirkland, in several experiments upon brutes, found the arteries in a day or two strongly contracted a considerable way: and in a case of the humeral artery tied for a spurious aneurism, on the third day the pulsation could not be perceived nearer to the ligature than an inch and half. Mr. Pouteau, *Melanges de chirurg.* p. 310, cites a case of amputation in the arm, where the ligature caused such violent pain that it was necessary to cut it an hour after the operation, and yet no hæmorrhage ensued. It is somewhat remarkable that Mr. Petit quotes a similar case, as a proof of the speedy formation of a coagulum; Mr. Pouteau, on the other hand, asks if it is not much more probable that the closing of the artery was owing to



to the tumefaction of the cellular substance; and cites this case as a confirmation of his doctrine. I am obliged to differ from them both, and attribute it to the natural contraction of the artery: for, in my opinion, it is neither probable that an hours space could be sufficient for the production of a coagulum, strong enough to resist the impetus of the blood in so large an artery, nor that a tumefaction sufficient for this purpose could be so soon brought on. For though, as Mr. Pouteau observes, the pain would assist the tumefaction, yet when the cause was removed, the swelling would certainly abate in the part that had been inclosed by the ligature, and no other remain than the general tumefaction of the stump; which could not be at all considerable at that time.

HAVING now considered the manner in which nature acts in closing an artery, and how it is assisted by ligature, I proceed to the practical part of this little essay, which is to attempt to prove the advantages

advantages of tying the artery *alone*, without any of the surrounding flesh; and to answer the objections that have been made to this practice.

MR. KIRKLAND has taken a good deal of pains, and with success, to obviate many of the objections usually made to the use of the needle. He seems sufficiently to have proved the *efficacy* of this method of securing arteries; and that it is not liable to produce those violent symptoms of irritation which have been charged upon it. He is however obliged to confess that the pain attending it's use is considerable; and to this we may add, that in many cases it's application is difficult and troublesome. Various other objections might be started; as, the danger of puncturing a nerve with the point of the needle; of puncturing an artery in the neighbourhood of that we are attempting to secure, or even the same if it runs obliquely, in which case it would be very difficult to stop the hæmorrhage; these, I say, and others might be insisted on, but the *pain* alone caused by this method

thod, will, I doubt not, be a sufficient inducement to a surgeon to reject it in favour of another, equally safe and less painful.

It is plain, from Parey's works, that his first method of tying arteries was to draw out the artery *alone* with a pair of forceps, and then put a ligature round it. He does not indeed appear particularly sensible of the advantage of this method; for he says, we need not be very anxious to draw out the artery intirely free from the surrounding flesh, as it will rather tend to strengthen the ligature, to include some of the neighbouring parts. I shall not spend much time in accounting for the reasons which induced him afterwards to change his method, and other persons to follow his example. Little can be inferred from the variations of practice, at a time when surgery was rather a mechanic art than a regular science, founded upon the certain grounds of anatomy and physiology. When the noble invention of tying arteries was first practised, it found numerous adversaries, who, from prejudice or envy,

were

were ready to catch at any accidental instance of want of success. This would lead the first followers of the practice to guard very carefully against any failure that might injure their reputations; and as the most obvious causes of a returning hæmorrhage were the ligature slipping off, or cutting through the artery, they would naturally attempt to obviate both these accidents by taking in a quantity of the surrounding flesh.

THIS is all that seems necessary to be said concerning the disuse of a method, which, as the most obvious and simple, was the first that was practised. It remains for me to prove, that, notwithstanding all objections, the ligature of the artery *alone* is perfectly secure, easy in practice, and less productive of pain, or other disagreeable symptoms, than the supposed improvement of the use of the needle.

AN artery, by the firmness and elasticity of it's texture, and it's want of sensibility,

is



is as little liable to injury from stricture, as perhaps any part of the human body.

THOUGH it be certain that intercepting the course of the nutritious juices into any part, will bring on the destruction and mortification of that part, yet a firm and elastic texture will, for a considerable time, resist the impression of a ligature, which is not extraordinarily tight, and adapted to cut. Now, the natural contractile power of arteries being so great, a ligature of very moderate tightness will prove sufficient to restrain the force of the blood, till the artery closes so effectually as to render a return of hæmorrhage impossible ; and the larger the artery, the longer it will resist the impression of the ligature. It is of importance to attend to this circumstance ; for the chief caution to be observed in tying an artery alone, is, not to draw the ligature too tight ; the effect of which is greatly to weaken the artery by separating it's circular fibres. Dr. Hunter has found by experiment, that when an artery is tied  
very

very tight, it is apt to burst in throwing in an injection, whereas, when the ligature is of moderate tightness, it will resist almost any force.

MR. POUTEAU, who from his theory of the tumefaction of the surrounding parts being the chief agent in closing the arteries, is necessarily an advocate for very extensive ligatures, has said all in their favour that an ingenious man can suggest. He argues, that unless a large portion of flesh be taken in, the compression of the ligature will cause a putrid solution of the subjacent parts, that may spread to the coats of the artery. This argument however rather concludes against taking in the flesh at all ; for, if a large portion be included, the ligature must be drawn tight, otherwise the exhalation of the juices at first, and the suppuration afterwards, will loosen it so, that it will not compress the artery sufficiently, as has frequently happened ; if it be drawn very tight, the event that Mr. Pouteau apprehends may take  
 I place.

place. Certainly, neither of these circumstances is much to be feared in tying the artery alone, as it's texture will undergo very little alteration from the first making the ligature till all danger of bleeding be over.

THE whole of the question comes at last to this ; whether a ligature, upon the naked artery, be capable of restraining the impetus of the blood, till the natural contraction of the artery causes such an obliteration of it's extremity, as to render the eruption of the blood impossible ? If this be proved, it will readily be granted, that all attempts to increase the tumefaction of the surrounding parts are to be avoided, as unnecessary, painful, and injurious.

BUT, as theoretical reasoning upon a matter of such importance is very insufficient, I shall hasten to the facts, a knowledge of which alone induced me to address the public upon this subject.

A LARGE artery may, with great ease be drawn out intirely free from the surrounding parts, and tied, absolutely without pain to the patient. This may be performed with various instruments. The common dissecting forceps are very proper for this purpose; as also an instrument, a figure of which is given in Cheselden's appendix to Gataker's translation of Le Dran's operations, tab. 13, where it is called, "an instrument convenient to lift up the end of any small vessel to be tied, that lies in loose membranous parts." This I have been told was first used for drawing out the large arteries in the manner this essay is designed to recommend, under the name of a *tenaculum*, by Mr. Bromfeild.

A SMALL artery cannot be drawn out so perfectly free from the surrounding flesh. It is not however difficult, with the help of the tenaculum, to draw it out so as to tie it with ease, and with much less pain than the needle gives. For my own part, however,



however, for the sake of avoiding pain as much as possible, I would rather chuse to trust the small arteries to lint and flour with compression, or fungous substances, of which, from the most undoubted evidence of facts, the *sponge* is to be preferred for security and efficacy.

IT is no inconsiderable advantage of this method, that the ligature always separates soon, and without any trouble; whereas, when the needle is used, the tedious separation of the ligature is frequently the cause of many inconveniencies, often giving rise to abscesses and sinuous ulcers. I have been informed of a case in which even the patient's death appeared pretty evidently owing to this circumstance.

THIS is the method of tying arteries, which, for several years past, has been practised by the ingenious surgeons of the *Manchester Infirmary*; in which, from the frequency of amputations, on account of diseased joints, the fairest trial has been

given of it's efficacy. During this whole time a needle has never been used in securing an artery after an operation, except in a very few cases, where, from the bad situation of the artery, or some other uncommon circumstance, it could not be drawn out so as to be tied; and I can, with the strictest truth, assure the public, both from what I have been three years an eye-witness of, and from the most respectable testimony of others, that there has not been a single instance of returning hæmorrhage, after an artery had been once fairly tied in this method.

THERE seems no reason to doubt that the same success would attend taking in the artery *alone*, where it is not divided; as in the operation for the aneurism. What instances I have seen proved equally favourable to it. Mr. Pouteau, indeed, relates two or three cases of the hæmorrhage returning from the place of the ligature, where the artery had been tied naked. I shall not call his facts in question, but

but where the number of opposite facts is so much greater, it seems but reasonable to attribute the want of success in his cases, either to too great a tightness and slenderness of the ligature, or to some other cause, which will not affect the advantages of this method when properly executed.

AFTER having shewn the security of this method of tying arteries, the ease with which it is performed, and the advantage it possesses, of being attended with no pain at all, in some cases, and but little, comparatively speaking, in others, it seems almost unnecessary to add, that it is exempted from all the inconveniencies, whether real or imaginary, attending the use of the needle. A stricture made upon an insensible part, cannot possibly occasion those affections of the nervous system which have been charged upon the ligature of the nerves, and sensible parts along with an artery; and experience fully justifies what theory would lead us to suppose on this head. In short, I  
am

am well convinced, that if this method of tying the large arteries especially, was generally practised, there would be no longer room for accusing this part of surgery of cruelty, nor any need of having recourse to a variety of boasted specifics and secrets, which at all times are a disgrace to a liberal and useful profession.

*F I N I S.*







## EXPLANATION OF PLATE I.

### FIG. 1.

- a.* An hollow artificial leg made of tin, and covered with thin leather.
- b. c.* Longitudinal steel bars, to be made of tough stuff, and as light as possible, with sufficient strength.
- d.* A moveable joint, to be placed exactly opposite to the knee joint.
- e.* A steel bow, made thin and elastic, to pass about two thirds round the lower part of the thigh, and fixed with straps of leather, to buckle on the fore part. — There is likewise another leather strap below the knee, which buckles on the outside.

### FIG. 2.

Represents an artificial leg made in the same manner, with the addition of a foot made of light wood, and moveable joints, so as to imitate pretty nearly the natural motions of the joints of the ankle and of the toes.

## P L A T E II.

Represents, in two different points of view, a leg on which amputation had been performed, with a flap, a little above the ankle joint.

FIG. 1.

That part of the bone which was sawed off.

*a.* The head of the bone corroded by the matter.

FIG. 2.

The piece of bone which exfoliated. Both pieces together were five inches in length, four of which were of the whole substance.

FIG. 3.

The arm, as it appeared after the wound was healed.

*a.* The cicatrix of the first incision.

*b. b. b.* The cicatrix of the incision, made to bring out the head of the bone.

N. B. The drawings from which this plate was engraved were made by Mr. Aikin, my pupil, who attended at the operation, and during the whole cure.



# E R R A T A

Page. line.

- 13 17 *for seised read seized.*  
 19 5 *for off read of.*  
 28 18 *after of read the.*  
 41 7 *dele than.*  
 47 13 *for astragulus read astragalus.*  
 14 *for os calcis upon the lowest read same*  
     *bone upon the inferior.*  
 60 17 *for cannot read can, not.*  
 64 14 &c. *read* “ In universum in sanguine ma-  
     “ teries est, apta producendo ossi, quæ  
     “ adeo frequenter in cellulosum spa-  
     “ tium intimum, interque convexam  
     “ superficiem membranæ intimæ arte-  
     “ riarum concavamque membranæ mus-  
     “ culosæ extremitatem effunditur, &  
     “ caseosa primo, inde callosa, quasi  
     “ coriacea, demum ossæ squamæ fit  
     “ simillima.”  
     Halleri Elem. Physiol. tom. viii. p. 316.  
 75 10 *after with read the.*  
 79 16 *for than read that.*  
 83 penultim. *after father read has.*  
 89 ultim. *after unite put a full stop.*  
 90 1 *read* If the fracture be long of standing, the,  
     5 *for roughened read roughned.*  
 96 16 *for could read would.*  
 99 2 *after in read the*  
 109 8 *for dislocation read reduction.*  
 125 7 *for inlargement read enlargement.*  
     8 *for intirely read entirely.*  
 127 13 *for glucæus read glutæus.*  
 129 3 *for notcie read notice.*  
 136 12 *for obicular read orbicular.*  
 140 7 *for interofocal read interosseal.*  
 149 21 *for inlarged read enlarged.*  
 173 9 *for have by me read injected,*

















